

THE PRESIDENT'S REPORT
FOR THE YEARS 1928-30

CONTENTS

	Page
The president's report.....	5-180
The University's internal progress and problems.....	7-83
The University's external relations	85-108
Administrative actions of general interest.....	109-23
University life	125-39
Changes in the faculties.....	141-72
Buildings and grounds.....	173-79
Conclusion	180
Report of the registrar.....	181-240
Report of the comptroller	241-61
Honor point system.....	264
Reports of the deans and administrative officers.....	265-450
College of Science, Literature, and the Arts.....	265-68
College of Engineering and Architecture.....	269-70
School of Chemistry.....	271
Department of Agriculture.....	272-82
Law School	283-93
Medical School	294-97
School of Nursing.....	298
Public Health Nursing.....	298-99
University Hospitals	299-309
College of Dentistry.....	310-11
School of Mines and Metallurgy.....	312-18
College of Pharmacy	319-28
College of Education.....	329-43
Graduate School	344-48
Mayo Foundation	348-52
School of Business Administration.....	353-54
General Extension Division.....	355-67
Summer Session	368-70
Department of Physical Education and Athletics.....	371-76
Department of Physical Education for Women.....	377-82
Department of Military Science and Tactics	383
School of Library Instruction.....	384
Dean of women	385-93
Counselor for women.....	393-94
Dean of student affairs	395-402
University Health Service	403-12
University Library	413-14
Geological Survey	415-16
Museum of Natural History	417-22
Interfraternity Council	423-26
Field secretary and General Alumni Association.....	427-28
Bureau for Research in Government.....	429

CONTENTS

	Page
Employment Bureau	430-32
Minnesota Union	433-36
Institute of Child Welfare.....	437-44
Social Hygiene Bureau	445-47
University Press	448-50
Ten years' activities in fields of scientific research.....	451-537
Collegiate educational research—report of Committee on Edu- cational Research	527-37
Publications of the faculties.....	539
Index	540 ff

THE PRESIDENT'S REPORT

*To the Honorable Board of Regents,
University of Minnesota:*

GENTLEMEN: This report contains a statement of the administrative changes and policies of the University for the biennium 1928-30. In addition it may not be improper, in view of the fact that ten years have elapsed since I became president of the University, if I take advantage of this occasion to call attention to some of the important things that have happened in the life of the University during this period and if, at the same time, I take a hasty glance forward for the purpose of outlining some of the problems that lie ahead.

The aspirations and ideals of scores of groups and of increasing thousands of individuals focus at the University of Minnesota. There is a natural tendency for each of us to see and analyze the University's usefulness and progress in terms of limited and specialized interest.

On the following pages the record is given of some things that have been done and outlines are given of others challenging us to action in the future. As these statements are seen in relation to each other and are viewed as parts of a ten-year story, a unified pattern can be seen.

There are times when even those closest to it are not sure of some details of this pattern. But today, in the light that follows ten years' efforts to make that pattern increasingly a thing of rare value and true beauty, it stands where its outlines are at least something more than a promise, even though ultimate fulfillment of high hopes is still before us.

**THE UNIVERSITY'S INTERNAL PROGRESS AND
PROBLEMS**

THE UNIVERSITY'S INTERNAL PROGRESS AND PROBLEMS

The most notable change in the University during the decade now closing is found in its material conditions. The campus has been transferred if not transformed; the heart of it has been moved from Folwell Hall and the Old Library to the Mall and the New Library. Changes almost as great have been made on the Farm campus. Due to the wisdom of the 1919 Legislature in providing the University with a building program extending over ten years, the University has been permitted to move forward in a constructive manner with the improvement of its educational facilities. The Northern Pacific tracks have been removed from the heart of the campus, many buildings have been erected, and the campus has been expanded. The following new buildings have been built during this period:

MAIN CAMPUS

Administration	Botany Greenhouse
Botany	Highway Laboratory
Memorial Auditorium	Law
Todd Memorial Unit of the Hospital	Library
Cancer Institute Unit of the Hospital	Mines Experiment Station
Students' Health Service Unit of the Hospital	Minnesota Union Addition
Out-patient Department Unit of the Hospital	Music
Minnesota Hospital and Home for Crippled Children (Unit of the Hospital)	Physics
Field House	Stadium
	Storehouse and Shops
	Chemistry Building Addition
	Sanford Hall
	New Electrical
	Heating Plant Addition

FARM CAMPUS

Horticulture, Plant Pathology, and Chemistry	Plant Industry
Home Management Houses	Veterinary Barn
	Dairy Building

NORTHWEST SCHOOL AND STATION (Crookston)

Dining Hall	Cottage
Health Service	

WEST CENTRAL SCHOOL AND STATION (Morris)

Agricultural Hall	Junior Hall—Dormitory
Health Service	Senior Hall—Dormitory

NORTH CENTRAL SCHOOL AND STATION (Grand Rapids)

Main Recitation	Dormitory
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GROWTH DURING TEN YEARS

It might appear from the foregoing list of new buildings that have been constructed on the campus during the decade, that additional structures are not needed. Attention, however, is called to the fact that the registration of the University has increased every year since the war. In 1919-20 there were 9,027 college students on the campus; in 1929-30 the registration had grown to 16,877. A study of the probable growth of the University was made in 1920 at the request of the legislature. At that time it was estimated that the University would have a total enrolment in 1930 of 13,000 students. This number was exceeded in 1926 by 1,450; in 1927 by 2,851; in 1928 by 3,713; and in 1929 by 3,877. In other words, the registration has increased far more rapidly than was expected when the building program was first put into operation.

During the past ten years the increase in floor space has been 66 per cent while the registration between 1916-17 and 1929-30 increased 167 per cent. The reason for using the 1916 rather than the 1919 figure for registration in this connection is that no buildings were erected between 1915 and 1918-19 and the building program which was approved by the legislature was based upon the accumulated registration of that date and the anticipated registration of the next ten years.

GIFTS

Equally significant with the growth of the physical facilities and the registration of the University are the gifts that have been made to the institution. These gifts approximate a total of \$5,225,000. No attempt is made to give a complete list of them here but it is significant that they have come from thousands of donors and for all sorts of purposes. They have been made for the purpose of supplementing and complementing the revenue which the state provides for the maintenance of the ordinary activities of the institution. Special attention should be called to the gift of Mr. William Henry Eustis which approximates \$2,244,892 for the erection of a Crippled Children's Hospital and Convalescent Home and their maintenance; to the gift of some fifteen thousand students, faculty, alumni, and friends of the University amounting approximately to \$1,229,088 for the erection of the Stadium and the partial erection of the Auditorium; to the Laura Spelman

Rockefeller Memorial gift of \$867,000 for the maintenance of the Institute of Child Welfare for the study of infants and the outlining of programs and courses for parental education; to the William J. Murphy gift of \$338,000 for the maintenance of the Department of Journalism; to the additional gift of \$800,000 from Drs. W. J. and C. H. Mayo during the period the Mayo Foundation was reaching a \$2,000,000 principal total; to the Citizens Aid Society, Mrs. George Chase Christian, president, gift of \$250,000 for the erection and equipment of a hospital unit for the treatment of persons afflicted with cancer; to the gift of \$45,000 from Mrs. Frank C. Todd, Mrs. E. C. Gale, and Mrs. Emory Mapes to apply on the cost of the Todd Memorial Eye, Ear, Nose, and Throat unit of the University Hospital; to the gift of over \$50,000 over a five-year period from the Bureau of Social Hygiene of New York City for investigation in co-operation with the Women's Co-operative Alliance of Minneapolis; to the gift of \$80,000 for the aid of worthy medical students, being the proceeds from the insurance policies of Dr. George G. Eitel of Minneapolis and to the gifts of many hundreds of other donors totaling just over half a million dollars.

GETTING MORE FROM TEACHER-STUDENT RELATIONSHIP

Buildings, gifts, and equipment are but visible evidences of progress within an educational institution. The real work of the University is to be found not in the buildings about the campus, but in the work and activities of the teaching staff, in the stimulation given students, and in the encouragement which the University gives to productive intellectual effort. One of the things which men have feared with the growth of the universities of this country is that students will receive less personal attention and consideration than they once did when the institutions were smaller. This is a fear which is father to the thought and does not conform with the facts. There is little or no reason for believing that individual professors are any less interested in the welfare of their students today than they were a generation ago; in fact, there is abundant evidence to support the contention that even in large institutions the members of the teaching staff are actively concerned and genuinely interested in the personal advancement of their students. In addition, however, these large institutions have created agencies which now give them far more knowledge of the

capabilities, the emotional inclinations, the vocational aptitudes, and the ambitions of the individual students than they ever possessed. While seeking in every possible way to increase a teacher's responsibility to and for each individual student, the University of Minnesota also has expanded the work of its dean of student affairs; it has added to the office of the dean of women; it has provided a Students' Health Service; it gives physical and mental examinations to all incoming students; it determines their emotional biases; it has created a vocational and advisory office and a personnel service; it has its student work committees, a trained psychiatrist, a visiting social worker, a committee which is empowered to place students of special gifts, as well as those who are suffering from some kind of special handicap, where they can do their best work, a clearing office through which all the business of the agencies pass, and where the records of each are filed. The net result is that the University of Minnesota today is in a vastly better position than ever before to advise students with regard to their work, their conduct, and their occupational ambitions and desires. In other words there has been a continuing effort during the entire decade to create those personalizing agencies within the institution which minister directly to the individual student. There never was a time in the history of the University when a student could receive so much help, so much advice, or so much information with regard to himself as he can now.

BETTER CO-ORDINATION WITH HIGH SCHOOLS

There has been progress toward better co-ordination of university curricula with the high schools of the state. This does not mean that the University presumes to direct the work of the high schools of the state in any respect but it does mean that notable progress has been made through this co-operation in co-ordinating the work of the public schools with that of the University.

One of the first evidences of this is to be found in the work of the Committee of Seven which studied many of the problems of co-ordination of high school and university work, from September, 1924 to May, 1926, submitting its final report in May, 1926. The members of this committee were:

Mr. J. C. West, superintendent of schools, Bemidji, Minn.

Mr. J. P. Vaughn, superintendent of schools, Chisholm, Minn.

Miss Elizabeth Clark, principal of the Technical High School of St. Cloud, St. Cloud, Minn.

Mr. J. E. Marshall, principal of Central High School, St. Paul, Minn.
Miss Marie Lange, teacher in the high school of Mankato, Minn.
Mr. E. M. Phillips, state inspector of high schools, St. Paul, Minn.
Mr. C. W. Boardman (chairman), principal of the University High School,
University of Minnesota

This committee arrived at the following significant conclusions:

I

The factors which control the selection of high school graduates for university entrance are: first, sociological factors such as the proximity of residence to the University, occupational and economic status of the parents, nativity of the parent, parental mortality and similar factors; and second, the sex of the individual student. The level of intelligence and the scholastic rank of the student in high school were found to be of relatively much less importance as factors conditioning university entrance.

The committee recommended that the high schools and the University co-operate in using every means to overcome the effect of these factors of selection so that students of superior ability may enter the University in larger numbers. For students of lower levels of ability, it recommended the organization of curricula and courses upon the junior college level leading to semi-professional occupations for which there is a demand, but which have been little recognized in the present formal educational program.

II

The committee found that the curriculum prescriptions of the high schools for graduation and the University for entrance lead to widely different types of preparation of graduates from high schools of different kinds and size; that where high school pupils have large opportunity of election they tend to choose subjects in those fields related to their interests, needs, and abilities, but that such elections do not lead to narrow specialization but rather to a well-balanced type of preparation for university entrance. The committee recommended that the University encourage larger freedom of choice of subjects in high school by decreasing the amount and number of specific prescriptions for entrance and by adopting a flexible program of election of major and minor sequences in high school subjects as a basis of preparation for university entrance.

III

The committee found that guidance in the high schools is largely unorganized and fortuitous in character, but that the University had instituted a comprehensive program of guidance and adjustment for university students. It recommended that the University aid the high schools in organizing and initiating a program of guidance by publishing bulletins of information in this field. It also recommended that the University consider reorganization of the courses in the freshman year so that it might be, in a larger degree, an orientation year, and that it reorganize the bulletins

of information concerning the University so that they might be more easily understood by high school administrators and graduates.

IV

The committee found that the University is cognizant of, and is studying, factors affecting student success, such as problems of university instruction, the marking system, causes of elimination, problems of student life, and other campus problems. The committee urged the erection of dormitories for non-resident students and recommended that high schools aid the University in orientating students to university life by endeavoring to instruct prospective university entrants in the meaning and problems of university life and by adopting teaching procedures in the final year of high school more closely related to a college type.

V

The reactions of students eliminated from the University were found to be in general favorable to the University, tho some criticism was made. These criticisms indicate the need for the University to continue careful study of its procedures, techniques of instructions, and of course content. The committee expressed the hope that the University could obtain funds to add larger numbers of the most highly trained, broad visioned instructors to the staff who should teach in the junior college years.

VI

The committee recommended that the high schools and the University continue a cordial co-operative study of the joint problems of the two institutions.

PROBLEMS OF THOSE WANTING TO ENTER COLLEGE

Significant progress has been made toward intelligent handling of those who want to come to college. Especially notable in this field has been the work under the direction of Dean Johnston and his associates, extended during the last three years to include all the colleges of Minnesota along with the University, undertaking to test the college aptitude of Minnesota high school seniors planning to go to college. This aptitude test was given this spring in co-operation with the colleges of the state and the public school superintendents and principals to 11,963 seniors. The information was filed with the high school superintendents and principals for their use in advising their students as to whether they should or should not go to college. Those in the lowest group, that is the group whose chances of success in college are almost negligible but who nevertheless are graduates of public high schools of the state, are not denied admission to the University. The parents,

however, are advised of the situation with the hope that this will ameliorate their disappointments in case their children fail in college. This plan of testing high school seniors for the purpose of determining their chances of success in college before entrance has resulted in a notable improvement in the quality of students coming to the University. Every year since the plan was introduced the freshmen have rated higher intellectually than they did the preceding year and there has been a corresponding improvement in the quality of work that they have done in college.

Of secondary interest along this line and of some significance is the self-appraisal experiment conducted in the summers of 1928 and 1929 and repeated at West High School in Minneapolis in the spring of 1930. The Session for Self-Appraisal is another effort on the part of the University to help young men and young women to answer three kinds of questions, namely:

1. Do I want to go to college? Can I profit more from some other type of special training? Can I be more successful and happier if I go directly from high school into my life's work?
2. If I go to college, what should be my line of study and interest?
3. What vocation should I most seriously consider as I prepare for my life's work?

COUNSEL FOR STUDENTS SEEKING GUIDANCE

The reports and the follow-up work undertaken by the committee in charge of this self-appraisal experiment seem to indicate that it is possible, if means can be found for its expansion, to determine within the limits of an inappreciable error the future possibilities of high school seniors in college.

Progress has also been made toward more intimate and effective contact between teachers and students in ways contributing directly to student growth. Notable in this field has been the developing of counseling programs of which the outstanding instances are those in the Colleges of Science, Literature, and the Arts; Agriculture, Forestry and Home Economics; Education; and the School of Mines and Metallurgy. An effective counseling service is now in use in all of the colleges of the University.

Practically all counseling service, as it is done in colleges and universities throughout the country, consists in little more than the formal giving of information regarding courses and prerequisites. There has been little opportunity for a student to re-

ceive educational guidance in terms of his own peculiar needs. The counseling effort at the University of Minnesota is an attempt to give advice in terms of the particular individual's background, plans, and needs.

An interesting indication of the extent to which this type of organized counseling has developed is to be found in the report of the Committee for the Co-ordination of Personnel Activities covering a special check of faculty-student contacts for the week of April 21, 1930.

This report showed that in one week 278 members of the faculty were seen by 3,588 students seeking counsel on problems ranging from classroom methods of study, employment, and finances, to health, emotional problems, home situations, social problems, college and vocational guidance, and purely personal matters. Forty-nine teachers making active use of the faculty-student contact desk from September 30, 1929 to June 30, 1930, reported 4,970 students coming to them during the year for counseling, outside of the normal and regular contacts incident to the carrying on of the work directed by those teachers.

It is evident that a student at the University of Minnesota has a wide variety of opportunities for close and stimulating contact with faculty advisers.

BETTER LIVING AND WORKING CONDITIONS

Progress likewise has been made toward better living and working conditions for the university community. Attention has already been called to the buildings erected upon the campus, but, in connection with the living and working conditions of the university community, special mention should be made of the completion of the Cyrus Northrop Memorial Auditorium, the Stadium, and the Field House, the final authorization for the construction of the first unit of the men's dormitory, and the authorization for the construction of a nurses' home as a possible unit in an enlarged, modern dormitory system for women.

Another approach to the effort to bring about better living and working conditions for the university community is found in the following studies that have been conducted by the University: The Chapin Study of Extra-curricular Activities, The Hovde-Umstadd Study of Self-supporting Students on the Under-

graduate Level, and the Salisbury-Silverman Study of Housing Conditions of Members of the Faculty Earning Less Than \$3,000 a Year.

Perhaps the most significant of all the efforts that have been made along the line of improving the living conditions of the university community is found in the opening of the home site area for the erection of homes by members of the university faculty under terms calculated to make more members of the faculty a permanent part of the University of Minnesota community.

IMPROVEMENT OF COLLEGE TEACHING

An effort has been made to secure better teaching. Two things have contributed to this more effectively than all other forces combined. One is the willingness on the part of the university staff to work in co-operation upon any and all problems that are calculated to conserve or minister to the University's general welfare, and the other is the constant willingness of the staff to be governed by objectively determined facts. A Committee on Educational Research, consisting of representatives from the various colleges, was created in 1924 for the purpose of studying problems directly related to administration and instruction in the University of Minnesota. This committee has now completed a number of notable studies which have had a far-reaching influence in the University of Minnesota and have somewhat enhanced its reputation elsewhere. This committee consisted of the following persons: Deans E. P. Lyon, O. M. Leland, W. F. Lasby, Everett Fraser, R. A. Stevenson, J. B. Johnston, E. M. Freeman, G. S. Ford, M. E. Haggerty; Professors Frederic Bass, R. E. Scammon, D. G. Paterson; and Dr. L. B. Wilson and Mr. J. C. Lawrence. More than forty different studies of problems concerned with teaching have been made or initiated during the past ten years (see Report of the Committee on Educational Research).

Some liberation and stimulation of teaching ability has been made possible by administrative changes during the past ten years. While the campaign in behalf of objective examinations has tended, temporarily, in some parts of the institution, to increase the mechanized handling of students by teachers, there has been, to offset this, the introduction of comprehensive examinations in the Law and the Medical schools and in most of the departments

of the College of Science, Literature, and the Arts. In addition there has been a noticeable tendency throughout the University to offer opportunities for students who "stand for honors"; such students are given a great degree of individual freedom in the selection and mapping out of their courses.

The necessity for co-ordinating work offered in two or more colleges has reflected itself in the offering of combined business and engineering courses, combined engineering and agricultural courses, combined business and agricultural courses, combined law and business courses, and combined education and music courses; in other words, it has become increasingly clear with the passing of time that students preparing for a given specialty may need to have their work reinforced by courses that are to be found and administered in another college. The general willingness on the part of the faculty to make available the entire educational facilities of the University for the purpose of supplying training necessary for the satisfaction of fairly definite objectives is one of the most notable, if not the most notable, characteristic of the faculty of the University of Minnesota.

In my opinion the most significant step that has been taken by the University of Minnesota in a generation in the direction of a better focusing of teaching effort and of students' interest, is to be found in the action of the Board of Regents of June 28, 1930, which provided:

That the President of the University is hereby authorized to create a committee consisting of representatives of the various schools and colleges of the University which shall have power to approve modifications of or substitutions in individual students' curricula with the provision that the modifications or substitutions thus authorized shall be accepted for credit towards degrees, and further that the committee shall have the power to determine its own modes of procedure and rules of action subject to the general laws and regulations of the University with the understanding that all modifications of the programs of individual students shall be filed with the registrar of the University.

In calling particular attention to the efforts that have been made to improve teaching, mention should be made of the study of engineering education from 1924 to 1927, conducted by the Society for the Promotion of Engineering Education which was carried on at the University of Minnesota under a committee headed by Professor W. E. Brooke. Mention should also be made of the Land-Grant College Survey of 1928, provision for

which was made by Congress. The University in co-operating with the Congressional survey set up a special staff to bring together at one point, for the benefit of the University itself, all of the materials requested from the various units of the institution by the parties conducting the land-grant study. Dr. Palmer O. Johnson was in charge of this work. Mention should also be made of a limited, but nevertheless state-wide, study of the demand for, and supply of, adult education in Minnesota, made under the direction of Professor Herbert Sorenson and Mr. Peder Pedersen in 1930.

Upon a recent public occasion your President, in discussing ways to improve college teaching, said,

The first and most important duty of any teacher, whether he be a teacher in the elementary school, the high school, the college, or the university, is the improvement of his teaching. At first thought it would seem that there could be no difference of opinion with reference to this. The statement seems trite enough. It is a commonly accepted opinion, I presume, that teachers are more concerned with the improvement of their teaching than they are with anything else, and yet an examination of their prejudices, their interests, and their activities seems to discount this opinion somewhat.

One cannot sweep through the history of education without being impressed by the change of attitude that has come about among college teachers with reference to teaching. In earlier days college teachers were deeply concerned about what their students learned and about the methods which they employed in teaching them. It is true that the methods which they employed were not scientific in character; they were based upon observation, experience, and philosophical deductions. The attitude of the teacher towards teaching was one of sympathetic consideration for the student; he guided the student step by step through the various fields of instruction; he led him by easy stages from the simple beginnings to the more complex parts of the subjects he was studying. The contact between the teacher and the student was intended to be one of helpful assistance to the student. Students were thought of as individuals and not as statistical units in a normal curve of distribution. In other words, the emphasis in those days was placed upon teaching; not upon administration. The eyes of

the teacher were turned in the direction of the student and he was constantly thinking of the changes which were occurring in the student's mind.

Growing Movement for Selection of Students—

Now we are thinking more of the selection of students; it was only yesterday, comparatively speaking, that college teachers went out into the highways and the byways with the most lurid sorts of advertisements to urge students to go to college and they were admitted even though they were young and had had only a limited amount of training. As the number increased, however, colleges began establishing and raising entrance requirements until today students entering college are older than ever before, and they have had more training than they ever had in all the history of civilization, and yet in the face of these two facts we find a wide-spread movement to exclude many of them from college on the ground that they are incompetent to do college work.

The students who come to college today represent a wide variety of types of mind; they are interested in all sorts of things; they desire training for many professions and occupations for which training was not provided two generations ago. That in itself may be one of the factors which accounts for the attitude of many of the college teachers towards students in general. With the widening of the scope of higher education so as to include these new types of mind and to provide training in many new fields, it is possible that there has not been a corresponding change in the types of college teachers. Formerly they were trained largely in the humanities; now they must be trained in all sorts of fields, scientific and semi-scientific in character, but usually with a fairly definite vocational or professional point of view in mind, and these newer subjects and fields may not be as stable as those of a generation ago.

Just how far the enthusiasms of these two groups, the humanitarians and the vocationalists, may have influenced college teachers in general to concern themselves with the selection of students at the beginning of their college careers is difficult to determine, but that it has been a factor in the retention of students within the separate professional college units can scarcely be denied, for the teachers in these various units have a keen professional interest in training only those who are likely to manifest some leader-

ship in their professions. Two generations ago college teachers were not concerned with the question of leadership; it seldom or never arose in their discussions; they were thinking about the needs and the aptitudes and the capacities of the individual pupil and what they could do for him; they permitted leadership to take care of itself. Nor were they concerned in those days with the selection and elimination of students. Now we have faced about almost completely, and instead of thinking of the student's welfare primarily, the college teacher's mind as a general rule is directed more towards administrative matters.

Scientific Methods No Substitute for Human Touch—

Whenever a college places its emphasis to a very considerable extent upon rules, devices, standards, tests, and other forms of measurements in the choosing and retention of students, it is inevitable that the instructors will become less rather than more sympathetic with students. Whenever teaching is concerned primarily with the salvaging of human ability, with its development in each instance to its utmost capacity, then teaching will be dignified and noble, and thought of in a professional way. While I believe in the application of scientific methods and scientific techniques to all questions and problems falling within the realm of higher education, still I am thoroughly convinced that baneful effects frequently follow virtuous actions even in the sphere of higher education. If it be true in the field of higher education that teachers boast about the number of students they have eliminated rather than about the number of students whose minds they have unlocked and whose energies they have directed into realms of still higher achievement, then education has fallen upon sad days.

Who ever heard of college teachers being required to grade their pupils according to a curve of distribution until within the last twenty years? I am convinced that the introduction of these curves of distribution did stimulate scholarship when they first came in. I am equally convinced that they have been retained and adhered to in such rigid form in many institutions that they have wholly lost their effectiveness in this respect and it is still further my candid opinion they are sometimes administered in positively unjust and harmful ways. I have known of instances where members of the staff felt that they must distribute their students according to the normal curve of probability no matter how intellectually

capable the students might be. If in any class of thirty there are fifteen especially gifted students who are deserving of the highest grade, it is obvious that great injustice is done if they do not receive that grade.

What May Result from Enthusiasm for Teaching—

The attitude of the average college teacher with reference to the improvement of college teaching is exhibited somewhat in his resentment to the supervision of his teaching. As a general rule, college teachers think they are well qualified to teach and they resent supervision in any form. To my mind a dean of instruction or supervisor of teaching would accomplish far more in the way of building that spirit within the institution which would be interested primarily in the welfare of the students than any other thing which we could possibly introduce. It would be very revealing, indeed, if we could have stenographic reports of sample lessons taught by college teachers; it would be especially revealing if stenographic reports for the same subject-matter could be taken every two or three years. Let the teachers become interested in teaching and the vast majority of college problems so-called will quickly disappear. We have fallen into the habit of thinking and saying that our college students are incompetent; part of this criticism is obviously due to failure to improve our teaching, and part of it is obviously indulged in for the reason that it seems to be popular.

I recently had occasion to visit eight of the alumni groups of the University of Minnesota along the west coast. As I went from place to place I gradually became conscious of the fact that the alumni, particularly the older ones, were asking the same questions and pretty much in the same order. The first question always related to some person who was on the staff when the student was in college. The second question concerned the college of which the questioner is a graduate. He wanted to know whether the college is progressive in its offerings. Does it keep its face to the future? Is it graduating men who can take their places in the world along with the best? The third question related to buildings and equipment. And the fourth question was an inquiry about how the university with ten thousand students could take care of the personal welfare of the student body. As a matter of fact, the older graduates had no definite notion of the dean of student af-

fairs, the assistant dean in charge of freshmen, the dean of women, the social director, the Students' Health Service, the personnel department, the vocational adviser, and other agencies like the student work committees in the various colleges, and the placement bureau. I was impressed with the fact that the questions which these distant alumni asked related to faculty personalities, to curricular organizations, to the nature of the equipment, and the welfare of the student body, and that they almost invariably asked the questions in that order. It was not until after these questions had been disposed of that any were asked with regard to the much discussed student activities.

Two Points of View—

Gradually the thought was borne in upon me that the older one is and the farther away he is from the scene of action, or both, the more disposed is he to place emphasis upon fundamental things, upon things that are most essential in an educational program and which minister most directly to one's success later on. On the other hand, the younger one is and the nearer he is to a given scene of action, or both, the more disposed is he to be influenced by the temporary, the ephemeral, the dramatic episodes of life. I realize that those who have been out of an institution for some years and particularly those who are some distance away, while they cannot help in solving the local and immediate problems, can be of enormous assistance in keeping the institution thinking straight, about the things which are fundamental.

I found, furthermore, on this visit that there were certain teachers who were inquired about far more frequently than all the others combined; their names stood out in bold relief in the memory of the graduates of the University; they were persons who learned the names of their students, who spoke to them as they passed by, who stopped them from time to time as they passed the teacher's desk to make inquiries of them about this or that, who placed appropriate comments on their themes or examination papers, and who in other ways showed a keen interest in their personal welfare. They were persons, I found, who were far more interested in their students than they were in the rules for elimination or selection, or curves of distribution, or other administrative devices for the administration of the University. My

observations confirmed the results which Dean Kelly secured for the Commonwealth Fund of New York City when he made his study some two or three years ago on liberal colleges.

Study of Techniques Must Be Supplemented—

The present generation of college teachers has grown up in an environment which emphasizes research rather than teaching as a basis of promotion. The public generally is less interested in teaching than it is in research. An appeal to a public audience for proper consideration of a teacher as an artist is regarded as a more or less sentimental appeal, while an appeal for support for the college teacher as a scientist meets with a far more hearty response. The world today is interested in concrete, objective products, things which it can use for the improvement of business, things which mean greater efficiency and greater dividends. It is not interested correspondingly in the more intangible outcomes and undefined ideals of college teaching.

If these assumptions be true, then what can be done to improve college teaching? One of the most important things, of course, is to induce as many college teachers as possible to think straight about teaching, to speak about it and to write about it as if they believe that it is a most important thing in the world. We do not have half enough of this kind of talk or articles of this character. I engaged the services of a young man to look through the magazine literature for the last five years to see just what has been said or written along this line, and we found that there is precious little. Practically all of the articles deal with one or the other of two things, either administrative matters or the improvement of some form of scientific technique. I am not asking that there be any less of this type of thing, I am merely suggesting that there be more of the other type.

Possible Benefits of Self-Study—

In addition to seeing that our own attitudes and points of view possess a wholesome regard for teaching, there is another thing which will do as much, or more than all others combined, to improve college teaching, and that is to induce the college teachers themselves to study college teaching. There are, of course, many hopeful signs that this is actually being done. The report of the National Committee on Mathematical Requirements, the report of the Committee on the Modern Language Study, the report of the Committee on the Classical Investigations, the report of the Committee on Engineering Education—these and other studies of like character are hopeful, but they need to be pushed one step farther. Some of those who have been making these studies in higher education should in every instance see that the studies are carried one step farther. They should find out what difference these studies

make in the teaching attitudes of the instructional staff and in the achievement of the pupils. If there is no difference made in these respects, all the vast sums which have been contributed to reports of this character are practically wasted.

How necessary it is that we should keep in mind at all times, everywhere, upon every occasion, that the fundamental purpose of an undergraduate institution is teaching, that all other agencies and devices of every nature and description exist purely for the purpose of making the teaching as efficient as possible. Schools are organized that there may be teaching. Whatever government there may be exists in order that the organization may be made as effective as possible, so that the teaching may be on the highest conceivable level.

The question of improving college teaching is a question of attitude just now rather than of method. Methods of attack exist and many of them are well known. Let the primary objective of college teachers be not primarily the training of gifted people or the elimination of students or the selection of students or rigid adherence to some curve of distribution, but the modification and improvement of their own teaching practices in order to achieve better things among the students—then we shall have better college teaching.

CO-OPERATIVE RESEARCH

Closely related to teaching in the University is research. Scientific discoveries and achievements of members of the staff during the last ten years have been especially notable, as indicated on pages 451 to 537.

Some significant and outstanding contributions have been made to the improvement of research techniques:

1. The methods of the Committee on Educational Research have been more or less unique in the field of higher education. This committee has worked steadily over a five-year period, with a membership composed of the responsible administrative heads of seven colleges and also a representation of teachers carrying no administrative responsibilities. This committee has demonstrated that it is possible to approach the study of educational techniques without setting up a bureau whose usefulness is largely defeated by its narrow, specialized approach to the problems which it is called upon to study.

2. Departmental and college lines have been increasingly obliterated in carrying on research projects in the life science and

physical science fields. When a project was to be presented to one of the great foundations for the support of work in the life science field the following men worked as a unit in formulating a plan: Dean G. S. Ford, Graduate School, chairman; Professors J. Arthur Harris, Botany; R. A. Gortner, Biochemistry; C. M. Jackson, Anatomy; R. A. Scammon, Anatomy; E. C. Stakman, Plant Pathology and Botany; R. N. Chapman, Entomology; G. O. Burr, Botany; C. H. Hayes, and W. A. Riley, Zoology.

3. The co-operative attack on research problems has been increasingly apparent in the field of social sciences. The Northwest Regional Survey was undertaken by the following committee: W. C. Coffey, G. S. Ford, R. A. Stevenson, William Anderson, Theodore Blegen, Andrew Boss, D. H. Davis, A. H. Hansen, Herbert Heaton, and G. A. Thiel.

During 1929 and 1930 a well-rounded study of the Consumer and Changes in Methods of Distribution of Consumer Goods has been carried on by the following committee: Dean R. A. Stevenson, chairman; Professors R. S. Vaile, Herbert Heaton, C. C. Zimmerman, H. J. Ostlund, R. M. Weidenhammer, and J. C. Lawrence. Advisory members are: Professors Charles Bird, Roy G. Blakey, Frederick B. Garver, Alvin H. Hansen, and Arthur W. Marget.

4. The unified approach to special research projects has been in evidence during the past two years in connection with the special symposia held during the summer quarter. In the summer of 1929 the Departments of Chemistry, Biochemistry, Physiology, Zoology, and Veterinary Medicine united in inviting to the campus, for a period of six weeks, a group of internationally famous physiologists. In the summer of 1930, another type of co-ordination was undertaken when the faculty of the Medical School undertook to sponsor a symposium which would bring to one series of scientific meetings, anatomists, pathologists, physiologists, and a wide variety of other specialists to focus theoretical discussion and clinical demonstration on a concentrated study of the kidney.

Important conferences have been arranged by the Municipal Reference Bureau on taxation, forms of government control, and social relief, which have had a direct bearing upon the solution of problems in these fields in many localities and communities throughout the state.

SIMPLIFIED ADMINISTRATION

Progress has also been made during the ten-year period toward simplified and strengthened administrative procedure. There has been a constant and persistent effort to avoid the creation of a large number of new types of administrative positions on the assumption that they tend to complicate administrative relationships within the institution. The opinion has prevailed that cooperation between the administrative and teaching forces of the University on important matters of vital interest to the welfare of the institution is absolutely necessary. The establishment of administrative offices with definitive powers and regulatory functions results in the long run in the creation of administrative machinery which operates for its own sake rather than in the interest of the student body. While the University of Minnesota has not been without its administrative officers and while these officers have had fairly well-defined responsibilities and functions, nevertheless for everyone—from the humblest worker in the institution to the chief administrative officer—the avenues of communication have been kept wide open and every idea or plan or suggestion looking toward the improvement of the institution has been welcomed and has received the utmost consideration.

One of the principles upon which this institution has been administered during the ten years has been the constant delegation, rather than a constant centralization, of functions as occasion demanded. A good illustration of the manner in which this is operated is to be found in the president's office. The University of Minnesota was the first of the great universities of this country to appoint an assistant to the president. This assistant, because of his training, experience, personality, and general capabilities, has taken on or acquired many functions which normally are administered by the president himself and this has been done without establishing permanent jurisdictions. During the ten years three different assistants have been appointed; each has taken unto himself those things for which he was best adapted, and relief has come to the president's office in new and novel ways with these changes. Similar adjustments have been made in the offices of most, if not all, of the important administrative offices of the institution. There are very few persons on the staff of the University of Minnesota who contend for "rights" or who preside over jurisdictions or who are more interested in their

"principalities" than they are in the welfare of the University. Whenever men begin to quarrel and contend about jurisdiction or rights and responsibilities, their usefulness as educational officers begins to decline at once.

One of the most significant things that has happened in the University in recent years was the action which was taken by the Administrative Committee of the Senate which is, after all, perhaps the most important administrative committee of the University. On March 4, 1930, it provided for the creation of a committee of its own members to study among other things the possibility of eliminating some of the administrative operations and simplifying those which might survive in the process of elimination.

WIDENED SPHERE OF STATE SERVICE

Progress has also been made during the ten-year period in state service. The agencies most actively functioning in carrying the University into the fields of state service—the General Extension Division and the Agricultural Extension Division—have been increasingly useful and active and their work has been supplemented by that of a number of fact finding agencies located on the University campus. The Bureau of Municipal Research has made an outstanding contribution to the people of the state. The Institute of Child Welfare, which is supported with funds supplied by the Laura Spelman Rockefeller Memorial Foundation, New York City, has been of great service to the parent-teacher associations of the state and to thousands of parents who are interested in parental education; the School of Mines has conducted its surveys of the mining properties of the state and has published the revised results from time to time for the information of the people of the state. Likewise, the geological surveys, under the direction of the Geology Department, have been pushed forward year after year with the hope that some time in the future we may have a complete topographical and geological map of this region. Studies of sandy soil, peat soils, and marl soils, under the direction of Dr. Alway, have revealed new ways of using these soils. The researches of Dr. Stakman and others have shown what the ravages of the black rust have cost the farmers of this region and have helped to supply means for the elimination or reduction of black rust. The co-operation of the University with

the State Highway Department, through the highway experimental laboratory on the campus, has been especially significant. The extension clinics of the Medical School, held in various centers throughout the state for the purpose of demonstrating to the doctors of the region improved methods of modern diagnosis and surgical treatment, have likewise been of great value.

Throughout the long list of activities which the University has fostered and encouraged in the interest of state service, certain convictions have been adhered to constantly. One is that the University is primarily an educational and research institution and as such its activities should be confined to instruction and the discovery of facts and the dissemination of information; and the other is that the University in all of its contacts with people, institutions, agencies, communities, and municipalities, should exercise no regulatory functions nor be clothed with police powers. The state service of the University is an educational, not a governmental, service. In its efforts to render increasingly effective state service, it is not always easy for the University to draw the line between fact finding and trail blazing which is the legitimate function of an educational institution, and other functions which are of a routine service or regulatory character, but this is a matter to which the University must give constant attention.

An almost continuous accounting to the people by the University for the trust placed in the institution by the people of the state has been the work of the News Service, under the direction of Mr. T. E. Steward. An institution as large as the University of Minnesota and with such varied interests naturally receives considerable public attention. The great danger, of course, is that isolated and remote cases, those of a bizarre and dramatic character, will be accepted as constituting the general spirit and life of the institution. Researches and events of the very greatest significance in the life of the University may be passed by with almost no comment; yet, after all, these are the things which in the long run have far-reaching effects in the industrial, economic, political, and social life of the people. The News Service established the *Minnesota Chats* which have been issued in various forms since May, 1923, and sent to those groups in the state who would be interested in each of the special issues. *Minnesota Chats* have definitely tended to present in attractive form information concerning the actual work of the University. This last year

copies of it were mailed to the parents whose children are in the University, at the request of the Dad's Day Association.

BETTER UNDERSTANDING OF THE WHY AND THE HOW OF THE UNIVERSITY

Some progress has been made during the ten years toward a better definition of the purposes and methods of functioning of the University. At least four experiences during this time have helped to bring about a closer definition, if not a better understanding, of the meaning and significance of the University, both on and off the campus, than could otherwise have been obtained. The first of these experiences has been the result of the study given to the purposes, problems, and functioning of the University by the Interim Commissions of 1921-22 and 1929-30. The report of the Commission of 1929-30 is not yet available so that one cannot discuss it. The resolution of the legislature for the establishment of the Interim Commission is stated in full on page 93.

The report of the 1921-22 Commission, however, is based upon the most comprehensive analysis of the University that has ever been conducted. This analysis is the result of an internal survey conducted by the University under the direction of Dr. J. B. Sears of Stanford University. His report is filed in five volumes covering every aspect of buildings, building uses, costs, administrative relationships, teaching personnel, student relationships, and the like. The studies instituted by Dr. Sears were continued by the registrar of the University and others until now there are in existence eleven volumes, each one dealing with some special aspect of the University. The 1921-22 Interim Commission of the Legislature had access to Dr. Sears' studies. On its own initiative it made a thorough investigation of the University, coming forward with a number of thoroughly constructive suggestions with regard to the future of the institution, and helping to define more clearly the purpose of the University and its relation to the state.

The second situation leading to a better definition of the purposes and methods of functioning of the University arose from the agitation for legislative action to prohibit the teaching of evolution, and from the action of the legislature on the proposed bill after public hearings.

A third step toward a better understanding was taken when

the Supreme Court of Minnesota decided what were the powers of the Commission of Administration and Finance in connection with the University, and incidentally, rather definitely and clearly outlined the broad responsibilities of the Board of Regents.

A fourth series of episodes, clearing the air and eventually making for a better understanding, has arisen in connection with the development of a program of physical training for men, of the students and for the students, under the direction of skilled teachers with high professional standards.

Each of these experiences has tended to bring out in bolder relief certain principles which were fundamental to the University. Stated briefly, they are that the University if it is to be a university in a true and genuine sense, must be free—free to pursue the truth wherever it may be found, free to teach that truth when once it is found, free to determine its activities and programs and policies in light of the high educational ideals that justify its existence, free from politics, free from partisan pressures, free from the pressures of groups or classes or individuals that would use the institution for ulterior ends.

EFFORT TO REALIZE IDEALS

Progress toward a realization of the ideals of the people has also been made in the University in more or less intangible ways. Concerning the ideals of the people for the University, there can be no uncertainty. Popular leaders from territorial days to the present time have stated in slightly different words the same ideals.

"Now is the time to begin. We should start with the determination that not a single youth of either sex shall be permitted to leave this territory to acquire an education for want of an institution at home fully endowed to meet the wants of this class." (*St. Anthony Express*, May 31, 1851.)

"The University of Minnesota as yet exists only in name, but the time has come when a substantial reality may and should be created, to which that name may be permanently attached." (Governor Willis A. Gorman's Annual Message to the Legislative Assembly, January 4, 1854.)

". . . . as a citizen of Minnesota, I have some pride in having a State institution which will reflect credit upon the State. . . . The simple object of this section (4)¹ as I understand it, is to make one great institution in the state for University purposes; nothing else under heaven The object is, I say again, to make the institution such as will reflect credit on the State. . . . (Sibley in *Proceedings and Debates of the Constitutional Convention—456*, August 13, 1857.)

¹ Section 4 was under discussion.

"It affords me pleasure to inform you that a contract has been entered into by the Regents for the construction of the new University edifice, which for architectural beauty and symmetrical proportions, when finished, will not be surpassed in the West." (Governor W. A. Gorman's Message to the Legislature at the Commencement of the 8th Annual Session [1857].)

"Richly endowed by government, with suitable and skillful professors, it (the University) should assure a high position among the literary institutions of the country." (Governor Samuel Medary's Message to the Legislature of the State of Minnesota, December 11, 1857.)

"I recommend particular attention on your part to the affairs of the University, which by the Constitution is recognized and declared to be a state institution, and authority given the Regents by act of the Legislature to issue bonds to be secured on the land appropriated by Congress for its support and endowment." (Governor Sibley's Message to the Legislature of the State of Minnesota, December 7, 1859.)

"I invite your immediate attention to the affairs of the State University and the condition of the lands appropriated to its permanent endowment. The people of the State have too high an appreciation of their obligation to posterity, to be indifferent to the security of this great trust. There should be no delay in adopting such measures as are requisite to preserve whatever inherent yet remains to the State in the University lands." (Governor Ramsey's Inaugural Message to the Legislature, January 2, 1860.)

"Truly by the estimate she sets upon schools and churches this young State is justifying the title some authors have given her—'The New England of the West.'" (Myron A. Manson in a Thanksgiving discourse preached in Northfield, November 24, 1870.)

"The University, being the chief institution of learning in the State and standing at the head of our system of schools, should be made to reflect credit on the State and be enabled to take position with similar institutions of the country. It should receive such substantial aid as may be consistent with the means at your (the Legislature) disposal and the demands of our charitable institutions." (Governor Horace Austin's Annual Message to the Legislature, January 4, 1872.)

"I invoke at your hands such fostering care of the educational institutions of the State as will ensure a growth commensurate with a proud material development, and adequate to the wants of an expanding future." (Governor Pillsbury to the Legislature, January 4, 1877.)

"Minnesota takes front rank among her sister states along educational lines. Her great University, the pride of all, is second to no similar institution in efficiency and is only surpassed in numbers by one or two others, enrollment of students this year being 3,400. . . . Its needs will be carefully looked after by your honorable body." (Governor Van Sant's Inaugural Message to the Legislature, January 9, 1901.)

To realize the implication of this popular ideal the University must face squarely the question of the purpose and plan of popular

education on the college level. Should all who seek admission be received? If it is to be selection or exclusion, upon what basis shall that selection or exclusion be undertaken? Can there be selection without a radical departure from the spirit in which the University has been founded and perpetuated?

One of the ideals of the founders and perpetuators of the institution has been that there should be at the University of Minnesota a capable and contented faculty group. The effort to maintain a capable and contented faculty group involves consideration of all of the factors governing working and living conditions.

Faculty working conditions at the University of Minnesota have been greatly improved during the past ten years. Faculty salaries, on the basis of the computation of Mr. Trevor Arnett, president of the General Education Board, in 1930, represent slightly more purchasing power than those salaries represented in 1920, altho the University actually has lost ground in maintaining faculty salary levels on a basis competitive with the salary lists of other comparable public and private universities.

The faculty insurance plan, approved by the regents in December, 1929, is another step definitely improving the status of teachers at the University of Minnesota.

A reasonable and workable plan for compensating teachers for reduced service at reduced rates, after those teachers have passed the retirement age, while under discussion at the present time, has not yet become a part of the University's plan of operation.

The Arthur Upson Room, in the Library, opened February 21, 1925, was and is a symbol of a very fine thing in the life of the University. This room, dedicated to the reading of good books for the pleasure derived from that reading, is steadily patronized by a very large number of students.

The building of the Cyrus Northrop Memorial Auditorium has given a vastly improved setting for many university functions and I think in time will be of increased spiritual significance to the life of the campus community.

The regents of the University in October, 1929, upon the recommendation of the Administrative Committee of the Senate, authorized the erection of a tablet specially commemorating the services of the builders of the name of the University of Minnesota. While the first public exercise recognizing the builders of

the name has not yet been held, steps are now under way for the holding of the first great meeting honoring those who have been responsible for the building of the name of the University of Minnesota.

A few typical illustrations from among a number should be given, showing that the University has become increasingly more cosmopolitan in character.

The fact that its students come from all over the world and that they go everywhere bringing increasing distinction to the institution is the best evidence of this.

The demand for the establishment of a University Press for the publication of the scholarly materials of members of the staff is assumed by many to be the most important event in the life of the University in the last ten years. The Press already has earned an enviable reputation for itself in America and abroad—a reputation which no doubt will be increased in the years to come.

Another extremely important event in the life of the University looking toward increasing its cosmopolitan character, was taken when a group of business men of the city of Minneapolis and the Minneapolis Institute of Arts joined with the University of Minnesota in financing the anthropological and archeological investigations by Professor A. E. Jenks in this country and elsewhere throughout the world for a period of five years.

Professor Jenks' first trip was to the Mimbres Valley, New Mexico, where he secured specimens of exceeding value. The second trip is to Europe and Egypt where he is continuing his excavations.

There can be no doubt as to the desirability or educational significance of carrying on work of this character. There should be at the University of Minnesota, if it is possible for this institution to obtain it, a complete, unbroken history from the earliest forms of human life on down as shown by the artifacts which may be obtained.

In other words, the University has in these and in numerous other ways attempted to foster those forces and agencies upon the campus which contribute that intangible thing which is called atmosphere or spirit. It has believed that the life which the people live and lead cannot be disassociated from the things they do and think; it has believed that it is as important that students be stimulated by wholesome living conditions as it is that their intellect be

whetted to the keenness of a razor; it has believed that the institution should be a laboratory of the spirit as well as a laboratory of the mind.

CORRELATION OF DEMANDS FOR SERVICE WITH PUBLIC SUPPORT

Some progress has also been made toward a better correlation of the demands for service with public support and also toward greatly enlarged private support. The figures for the years that are being compared show :

	1920	1930
Student Fees	\$ 497,355.00	\$1,167,980.00
State Support:		
Legislative appropriation	1,865,000.00	3,225,000.00
Mill tax	425,359.00	433,045.00
Land and buildings	542,492.00	498,482.00
Other	153,210.00	662,067.00
Federal Support	303,979.00	503,885.00
Private Support	395,965.00	1,188,766.00
Other University Income	1,071,767.00	3,336,282.00

Broad questions of purpose and policy are involved in the determination of whether the share of the total cost of operating the University should be borne directly by students through the payments of fees.

Some progress has been made toward a better co-ordination with the parents of students and with alumni. In November, 1928, the fathers of students attending the annual Dad's Day banquet, organized a Dad's Association, and the executive committee of that association has met on a number of occasions with the president and other administrative officers of the University, studying at first hand problems of direct concern to their sons and daughters.

About the same time that this association was organized the mothers began holding Mother's Day meetings on the campus; these meetings have been largely attended. This last year approximately two thousand mothers and students sat down together at dinner in the University Armory following a day of visitation upon the campus.

During the past year the officers of the General Alumni Association and a special committee of members of that association, have held numerous conferences on the campus and have attended several meetings of the Board of Regents.

In making the foregoing statements no attempt has been made to list in detail the various changes, that have been in the nature of improvements, that have occurred in the institution during the ten years nor has any effort been made to describe the manner in which the general reputation of the University has been enhanced outside the state of Minnesota. One of the best evidences of this is the number of graduate students who come to the University of Minnesota from other states and from foreign countries for advanced work. Today Minnesota is fifth among the universities of America in the number of foreign students she has registered with advanced grade.

If one were to list the distinctions which come to the members of the staff and the calls which have been made upon them for service in this country and abroad in recent years the catalog would indeed be long.

After all, of course, the reputation of the University depends, in the final analysis, upon its staff; it depends upon the ability and quality of the men and women who offer its instruction and direct its researches. Men and women of the staff of the University of Minnesota have been of such high quality that their services have been sought during the last ten years by foreign governments, great business organizations, industrial enterprises, educational institutions, congresses of various kinds, everywhere throughout the world. There are 119 members of the staff in *Who's Who* and 199 in *American Men of Science* as against 88 and 131, respectively, in 1920-21. This is one of the best evidences of improvement in the quality of the teaching personnel.

SOME OBVIOUS FUTURE POSSIBILITIES

Enough, perhaps more than enough, has been said about the aspects of university life that have been emphasized during the past ten years. The time has come when we must look forward. It is not easy, indeed, it is not always safe, for one to make predictions and yet an institution that fails to plan for the future soon becomes antiquated and if it be an educational institution it soon becomes useless.

Progress is being made with such rapidity in all phases of life, and changes are being made with such frequency that the University must be constantly inventorying its programs if it is not to lose step with progress. Its forms of administration, its cur-

ricula—indeed the very content of its courses—must be modified from year to year. All this means that it must be consciously awake to its own problems and to the world for which it is training men and women for the practice of their various specialties. Earlier in this report attention was called to the fact that the University has already established agencies for the continuing study of its problems. These agencies need to be strengthened, for new problems of great significance are arising with increasing frequency. These problems arise out of the moving forces of life outside the institution as well as out of the increased growth of the institution.

The part which the University of Minnesota will play and the place which it will take in the development of the Northwest is still a matter of conjecture, but that it will play an increasingly important part and take a more important place in this region in the future is the opinion of many of those who are trying to understand and to interpret the changes that are taking place in American life.

Not so many years ago we thought—indeed, we still do—of the United States as being comprised of so many political divisions. Yet these divisions have become little less than convenient devices for the selection of public officers. State lines are being disregarded in practically everything except politics. There are no tariff barriers between the states and channels of trade are not dammed by political lines. The struggle for prosperity is not between political divisions but rather between economic centers where wealth is concentrated. These great centers—some half dozen or more—are reaching their long attenuated arms of trade into every section of the country. Minneapolis and St. Paul constitute one of these great economic centers—they are the financial capital of the Northwest. From the standpoint of business and industry, which are basic to the prosperity of the people, this great economic center is interested in the welfare of the people of North and South Dakota, and Montana, as well as Minnesota. Some of the money which may have been responsible for the development of the Northwest came in from other economic centers but, as a matter of fact, much of it has been coined, so to speak, out of the soil, the mines, the forests, and the streams of the Northwest. But the resources of nature are not boundless nor are they inexhaustible. As they have been depleted from year

to year, the ingenuity of man has devised substitutes for them so that the wealth of the people in this region, that is the actual money in hand, has increased from decade to decade.

But we are now entering upon a period in which life is being transformed. The number of persons living on the soil is constantly decreasing. The man who farms a small farm is finding it difficult to make a profit. The grain farmer is disappearing. Farms are increasing in size. More machinery is being introduced for the purpose of cutting down the overhead. It is true that where diversified farming or where large-scale farming has been introduced, farmers are still on the upgrade but there is no good reason to suspect that the number of persons living on the farms in the Northwest will increase; in fact, it will probably decrease; nor is there any good reason for believing that the total number of persons living on the farms and in the cities in this region will increase—certainly not rapidly in the years just ahead. It is true that there will be a shifting of the population from country to town, from town to city, but this will not affect the total population living in the area to any considerable extent.

Nor is there any good reason for assuming that the Northwest will ever become predominantly industrial. It is true that there is room for development in this respect due to the presence of lignite fields in North Dakota, coal in Montana, and peat in Minnesota. But the probabilities are that industry will still find it advisable to ship the iron ore of the Minnesota mines to existing industrial centers. Unless new natural resources are discovered in this region, or new uses developed for those we already have, there is little prospect of a burst of industrial growth, such as, for example, that which came to Michigan with the swift enlargement of the automotive industry.

MARKED ADVANTAGES OF NORTHWEST REGION

These assumptions are not made with the thought that there will be no improvement in the prosperity of the people of this region. There will be. Ways of increasing the wealth of the region will be found. The point I am trying to make is that this region is not likely to become especially distinguished in the near future as an industrial center. Furthermore, although it will always be one of the great agricultural areas of the world, it will not produce more than it will be able to sell at a profit. Even

farmers living on the richest soil in the world will not engage in farming at a loss. If these assumptions are correct, then it is important that the leaders of this region take a long look ahead for the purpose of determining what are the marked advantages of this region, the attractions that make it a pleasant and profitable place in which to make one's home.

It is my candid opinion that in the years to come Minneapolis and St. Paul will advertise to the world the virtues of the Northwest as a place to live rather than as a place of great industrial establishments. Its climate, its lakes and streams, its topography, even the very air of the region, are physical factors of great interest to everyone. Here we have a people that has fewer persons in the poorhouse than neighboring states in the South and East; here wealth is more evenly distributed than it is elsewhere in this country; here there is less concentration of it in the hands of a few than usually exists. Here we have a people whose average wealth will continue to increase. Everybody will enjoy some prosperity. It will be a people that is interested at the same time in rebuilding its forests, preserving its streams, conserving its game, in filling its lakes and streams with fish of all kinds, and in preserving the scenic beauties of the state.

In emphasizing these qualities it should not be understood nor interpreted that any attempt is being made to minimize the importance of studying our soils, our livestock, our poultry, our clays, our peat, or any other thing which will contribute definitely or directly to the material prosperity of the people. I have already said in another place that the University of Minnesota could spend millions upon such researches which in the long run would contribute more in a single year to the material prosperity of the state than the state has appropriated in all of its history for the maintenance of the University.

A NATURAL CULTURAL CENTER

There is something else which, to my mind, is deserving of far greater consideration than it has yet received, and that is the importance of making Minneapolis and St. Paul the intellectual, the cultural, the educational, as truly as they are the financial center of the Northwest. To do this means that greater emphasis should be placed upon art, music, and education. It is my opinion that more money flows out of the Twin Cities every year to assist

in maintaining private institutions elsewhere than is given to the University of Minnesota and all other private colleges of this state during any one year. Men are interested—and rightly so—in their alma maters; but it is sheer blindness for them to maintain that they are justified in spending all of their surplus money for education or relief or religion in remote parts of the world, neglecting at the same time to spend adequate sums for these things at home.

With regard to education, and particularly state university education, there still prevails a provincial point of view. There are those who think that all of its support should come from the state, none from private sources. I have heard men in this state say that "the thing you are suggesting the University needs, it should have; if it were a private institution I should be glad to give money to support it but since the University is a state university it should go to the legislature for money for such projects." And then there are those who are constantly raising the question, whether the University should admit any students from neighboring states and, if so, whether it should not charge them the full cost of their tuition.

It is my belief that the exercise of highest leadership on the part of the leaders of this region would mean not merely the development of our natural resources and the conservation of nature's bounties, but the development of a great urban center which places high emphasis upon music, art, religion, education. This region and particularly these cities should be inviting and comfortable places to live in; the cities themselves should be the intellectual and artistic capital of this whole area. Perhaps it may be maintained that they are now, but they can be developed in these respects until they become the envy of the world.

So far as the University is concerned, perhaps I can make clear one aspect of this situation by citing a few cases. The University of Minnesota has the only full-fledged medical school between Chicago and the Pacific Coast. Human beings get sick in North Dakota, South Dakota, and Montana, as well as in Minnesota, and they must have medical attention. It is true that some of the doctors who practice in this region will come from other institutions of learning; on the other hand, it is quite natural to presume that most of them will come from the University of

Minnesota. It is certainly conceivable that these states may in the course of time establish medical scholarships for the training of doctors, surgeons, and nurses who will eventually minister to their own people. Not all of these scholars would come to the University of Minnesota; on the other hand many of them would. While it would be to the interest of the states in the Northwest to do this, it would likewise contribute to the business interests of Minneapolis and St. Paul if they joined in creating scholarships of this character. It is good business to promote good health.

What I have just stated with regard to medicine applies with equal force to dentistry, nursing, public health, sanitary engineering, architecture, and mining engineering, as well as to a number of other fields. To be sure, each of these states has its own university and college of agriculture, and for much of the fundamental work and for work of an advanced character in certain fields, these universities and colleges of agriculture are of high grade and students should be encouraged to attend them, just as the students from Minnesota should be encouraged to attend the University of Minnesota in the fields in which it is strong. But the University of Minnesota has offerings that are not included in the program of many of the neighboring universities and here is an opportunity for those states and for the philanthropists of Minnesota, as well as those who are interested in developing business in Minnesota, to provide funds for the training of leaders in certain fields. The work of these men will contribute in the long run to the material comforts and the material prosperity of the region in which they reside, and will help to make life more worth living generally. I am not insensible to the fact that this plan would enhance the reputation of the University of Minnesota and that it would secure a certain loyalty and sentimental attachment for itself and for this region on the part of generations of young people who in the course of years would exercise this leadership in their respective communities.

NO REASON TO SHUN FURTHER GROWTH

There is no good reason to believe that the University will not continue to grow. There are in the state of Minnesota, roughly, around 180,000 persons of college age; somewhere between 15,000

and 20,000 of these are in college in Minnesota and elsewhere. Large numbers of those not in college are persons of very excellent, if not superior, ability. For reasons which seem too obvious to need discussion, it is safe to say that more of them will go to college in the future than have gone in the past.

There will arise, of course, from time to time the question as to whether or not increasing thousands of students should be assembled in a single institution. There are many persons who cling to the idea that a small college possesses advantages over a large college. On the other hand, a large institution possesses some advantages over a small one. It reduces overhead; it simplifies administration; it makes possible a greater variety of programs of instruction without a corresponding increase in cost; it provides more opportunities for intellectual stimulation and the cross-fertilization of ideas; it increases the opportunities for leadership and the development of leaders among students; it multiplies the contacts which students have with persons in a wide variety of fields. One of the chief advantages claimed for a small college is that there is more intimate personal contact there between the staff and students. This is undoubtedly true in some instances; it is not true in others. To assume that there is no contact of this character in institutions where there are 10,000, 15,000, or more students, is to make an assumption which is contrary to fact.

Again, the studies which have been carried on at the University of Minnesota by Professor Hudelson show that the size of class is no measure of the achievement of students. In other words, students do as well, so far as we are able to tell, in large classes as they do in small classes. Surely there should come a time in the development of every student when he can work independently or almost independently of his instructors. If he must be hand led and hand fed at all times without any growth in independence, then it would seem that our whole instructional process is subject to criticism.

There is and has been for a number of years a decided tendency to limit registration at various colleges and universities. This movement has had the sanction of powerful forces in this country. There have even been those who have maintained that none should be permitted to attend college unless they are able to pay the full cost of college instruction. It is my opinion, in case existing

institutions of higher learning exclude thousands of students who are clamoring at their doors for admission, new colleges will spring up, new forms of taxation will be devised, and opportunities for higher education will become still more diverse. The doctrine of equality of opportunity, of giving everyone a fair chance and a square deal is too inherent and deep-seated in the traditions and life of the American people for any group or class to succeed with its plans for caste education.

The growing complexities of our social order, the increase in the number of types of problems we are called upon to face, the demand for a wiser use of leisure time, the necessity of retaining one's adaptability and plasticity until late in life, the spreading influences of the machine age—these are some of the factors that are sending more and more students to college. They are not all coming because of some great personal urge for more learning—some of them are coming because of the social and industrial urge. Yet it is true, and I think can be demonstrated, that there are more students in college and a larger percentage, too, with a genuine urge for learning than were ever there before.

JUNIOR COLLEGE

There has been much discussion in recent years of the desirability of establishing junior colleges to take care of the increased number of persons applying for admission to college; in fact, the junior college movement has spread. There are many more junior colleges today than there were ten years ago. Many of the arguments, however, that have been advanced in favor of them are utterly fallacious. It has been claimed that the establishment of the junior college would reduce the registration at the University, that it would reduce the cost of maintaining the University, that students in the freshman year at the University are too young to be away from home. Not one of these things is true. If the history of American education is to be believed, then the establishment of new educational units will increase and stimulate interest in education and the number of persons in school on the next higher level will be increased. The University of Minnesota might lose some students if junior colleges were established in the state; it might even abandon its freshman and sophomore years, but this loss would be only temporary; in the course of four or five years

the loss would be more than made up in the junior and senior years and where education is still more expensive. Not only is this true but the freshmen are actually older today in years than they ever were; they are older than their fathers and grandfathers and great grandfathers were. If they are too young to be away at school at the age at which their fathers, grandfathers, and great grandfathers were old enough to be away at school, then we should look well into the social and moral influences surrounding them.

If the people of the state really desire to provide more higher education for more children nearer at home and at greatly increased expense, then they should advocate the establishment of junior colleges. Junior colleges cannot be maintained without support; they must have classrooms, laboratories, a library, and perhaps dormitories. If they are to be established at all they should be established by districts; the state should see that there are enough young people in each district to justify the establishment of a junior college and that the wealth of the district will enable it to provide its fair share of support for the college. Junior colleges should not be allowed to grow up indiscriminately without state plan. As a matter of fact they should be a part of the state system of higher education.

I believe that the junior college movement will continue to expand. Some private four-year colleges will eventually become junior colleges here and there and junior colleges will be established as a part of the public school system.

A GREAT MUSIC CENTER

At the close of the decade 1920-1930 the agreement uniting the interests of the Minneapolis Symphony Orchestra and of the University gives added uniqueness to Minnesota's position as an outstanding center of musical interest and effort. Music is a natural part of life for a very large part of the campus population. And the presence of great artists in the Cyrus Northrop Memorial Auditorium leads to high levels of endeavor in student productions of grand opera, light opera, and sacred music. The next ten years are rich with promise in this field.

MATERIAL DEVELOPMENT OF THE CAMPUS

The legislature in 1919 made provision for a building program extending over ten years and the legislature in 1929 extended that program for another ten years. The amount of money made available for the ten-year period closing in 1929 was \$5,600,000; the amount available for the next ten years is \$300,000 per year. While these sums are not large, they have, nevertheless, enabled the Board of Regents to plan intelligently and consistently over a long sweep of years for the development of the University. Buildings have been necessary for two reasons: One is the increase in registration and the other is the expansion and differentiation of the sciences. The registration, as we have already said, is likely to continue to increase. There is no good reason to believe that science has reached its ultimate limits.

The University with a stationary registration would still find it necessary to erect new buildings from time to time because of the changes and differentiations that are occurring in the various fields of learning. There was a time, for example, when all engineering could be housed in a single building. Then engineering began to split into divisions of departments of civil engineering, mechanical engineering, electrical engineering, and in more recent years chemical engineering. There was a time when medicine had no specialties. Then with the more intensive study of the human body and of various diseases we began to get the various specialties and each of these specialties calls for a hospital unit with its own laboratory and equipment. It is so in every field of learning. As the needs for society become more numerous and as the various sciences discover new ways of satisfying those needs, new facilities and buildings must be made available for the training of persons.

Consequently the next ten years must see still further development of the campus. Certain new buildings will be erected. In what order these buildings will be erected has not yet been determined by the Board of Regents but a report was filed with the last legislature showing the building needs of the University. That report contained the following statement:

"The 1919 Legislature voted its approval of a ten-year building program for the University. This action met with practically unanimous approval, for the need for capital outlay for major structures was recognized by everyone. Furthermore, the distri-

bution of the building fund over a ten-year period was likewise regarded as sound, for it permitted the regents to study each of the building requirements of the University with greater scrutiny and care than would otherwise have been possible.

"Before any of the money actually became available, it was found, on account of increasing building costs, that not all of the buildings could be erected. In addition the legislature, by its own action, withdrew \$647,000 from the total allotment to pay the state's share of the cost of removing the Northern Pacific tracks from the heart of the campus. Fortunately a number of citizens have, during the ten-year interval, given money to the University for buildings.

"It may be of interest to know what buildings the University has, how many square feet of floor space it had in 1918-19 and how many it has now. Table I gives these facts.

TABLE I
A. MAIN CAMPUS

Building	1918-19 Square Feet Floor Area	1927-28 Square Feet Floor Area
Business Administration	22,900	19,289
Pillsbury Hall	49,743	49,743
Law (Old)	20,600	21,893
Shops (Old)	9,742	.....
Pharmacy	22,623	22,623
Storehouse (Old)	7,800	.....
Library (Old)	37,306	37,306
Ore testing	14,382	.....
Dentistry	32,043	32,043
Armory	56,369	56,369
Observatory	622	622
Mechanical Engineering, No. 1.....	22,832	22,832
Mechanical Engineering, No. 2.....	22,700	23,017
Pharmacognosy	3,894	3,894
Physics (Old)	17,842	17,842
Barn	975	.....
Military garage	5,468	.....
Education	25,501	25,501
Psychology and Board of Health.....	32,392	32,392
Folwell	82,021	82,021
Greenhouse	9,980	9,980
Child Welfare	3,400	4,193
Animal house	3,700	3,700
University Hospital	41,000	109,865
Experimental Engineering	36,317	48,045
Main Engineering	69,000	72,806
Anatomy	54,818	54,818
Millard Hall	67,079	67,079

Building	1918-19 Square Feet Floor Area	1927-28 Square Feet Floor Area
Heating plant	12,744	18,722
Chemistry	90,000	128,310
Women's Gymnasium	34,962	36,364
School of Mines	42,811	42,811
Biology	56,544	58,272
Music .....	.....	27,546
Mines Experiment Station .....	.....	48,082
Library (New) .....	.....	172,712
Electrical Engineering .....	.....	46,822
Storehouse—Shops .....	.....	65,492
Administration .....	.....	66,443
Greenhouse (New) .....	.....	5,592
Botany .....	.....	32,379
Physics (New) .....	.....	69,595
Law (New) .....	.....	39,764
Main Campus total square feet.....	1,010,110	1,676,770

B. AGRICULTURAL CAMPUS

Health Service	9,978	9,348
Music Building	7,734	7,734
Botany	19,602	19,602
Sheep barn	8,784	8,784
Dining Hall	44,229	42,892
Power house	13,606	13,606
Horticulture	13,586	17,453
Meat house	6,112	6,112
Veterinary	20,564	20,564
Biochemistry	14,445	14,445
Livestock pavilion	21,441	21,441
Administration Building	73,662	73,662
Home Management house .....	.....	7,288
Shop and fire barn	4,515	4,515
Dairy feed barn	22,361	22,361
Horse barn	13,632	13,632
Cold storage	7,186	7,186
Agricultural Engineering	41,427	41,427
Agricultural Engineering shops	25,585	25,585
Home Economics	48,494	48,494
Gymnasium	30,086	30,086
Dairy experimental barn	3,360	3,360
Seed storage plant	8,183	8,183
Veterinary barn	8,291	8,291
Haecker Hall .....	.....	36,947
Plant Industry .....	.....	31,583
(Many small structures little changed over 10-year period)		
Agricultural Campus total square feet....	466,863	544,581
Both campuses grand total square feet....	1,476,973	2,221,360
Built without cost to the state—		
Stadium (Dept. of Physical Education rooms)....	.....	70,725
Field House .....	.....	142,081

"From the above table it will be observed that the increase in floor space since 1919 has been 66 per cent.

"Attention is called to the fact that the above totals do not include the Field House (142,081 square feet) and the space underneath the Stadium (70,725 square feet) which afford relief for the physical education program of the University, but which do not provide additional space for academic instruction.

"The registration of collegiate students, excluding the schools of agriculture, extension courses, and Summer Session, and including only those of college grade in attendance on the campus from September to June was:

In 1915-16	5,180
In 1927-28	12,552
An increase of	7,372 or 142%

NOTE.—The reason for using 1915-16 rather than 1919 is that no buildings were erected between 1915 and 1918-19 and the building program of 1918-19 was based upon the accumulated registration of that date and the anticipated registration for the next ten years.

"A study of the probable growth of the University was made in 1920 at the request of the legislature. According to this study it was estimated that the University would have a total enrolment in 1930 of 13,000 students. This number was exceeded in 1926 by about 1,450; in 1927 by 2,851. In other words, the registration has increased more rapidly than was expected when the building program was first put into operation.

"The buildings listed in the Comprehensive Plan which have been erected during the ten years are as follows:

	Estimated Cost	Actual Cost	
Administration	\$400,000	\$471,000	
Physics	450,000	450,000	
Animal Biology	250,000	220,000	The erection of the Botany Building has relieved this situation.
Animal Industry	200,000	25,000	Veterinary Barn
		224,000	Dairy Building
Auditorium	500,000	800,000	Largely gifts
Chemical Engineering	200,000	398,000	
Electrical Engineering	250,000	341,000	
Health Service	200,000	206,000	
Home Economics addition..	60,000	30,000	Separate home management houses have given some relief.
Hospital pavilions No. 1 and No. 2	450,000	162,500	Todd Memorial—partly gifts
		250,000	Cancer Institute—gifts
		250,000	Children's Hospital—gifts

Institute of Anatomy addition \$75,000.

Additions to Anatomy and Millard Hall have been abandoned for the time being in favor of a more adequate hospital and dispensary into which will be put a considerable amount of the work now being done in these two buildings, thus relieving their congestion somewhat.

Law	250,000	250,000
Library	1,250,000	1,176,000
Mines Experiment Station..	175,000	312,000
Music	200,000	259,000
Plant Industry	400,000	250,000
School of Mines addition..	150,000	

This situation relieved by erection of Mines Experiment Station.

Minnesota General Hospital		
Out-Patient Department..	367,000	367,000
Roof house	28,000	28,000

Buildings in the original list for which no provision has been made:

Dentistry addition	75,000	With the condensation of the dental program this need has become somewhat less urgent.
Mechanical Engineering	250,000	Some relief has been obtained for Mechanical Engineering by the construction of the Electrical Engineering Building, but better facilities are still needed.
Nurses Building	125,000	Urgent need
Observatory	75,000	Highly desirable
Training School	200,000	Still an urgent need

"Certain needs not listed in 1919 developed and became so urgent as to take precedence over some of the needs there listed. Among these may be mentioned the following:

Sanford Hall addition	\$202,000
Removal of the Northern Pacific tracks and provision for the Northern Pacific viaduct.....	647,000
Alterations in Horticulture, Plant Pathology and Biochemistry...	88,000
Classroom building at Morris.....	85,000
Cottage at Crookston.....	16,500
New roof house on Elliot Hospital.....	41,000

and other minor allotments which bring the total of the allotments from the Comprehensive Building Fund to \$5,673,554.

"From the foregoing it is clear that the University has been unable to carry out the program as planned, even though the legislative appropriations have been supplemented by generous donors. No institution whose floor area has increased 66 per cent while

its student body has increased 140 per cent can be said to have solved its building problem.

"The regents have conducted another survey of the building needs of the University. They have reviewed the situation in the light of the student growth, in terms of the expansion of the various sciences, of the pressures brought to bear upon the University by various forces within the state, and of the types of service a university should seek to render the state.

"Certain building requirements first outlined as legitimately necessary ten years ago, represent much more pressing needs today than they did in 1918-19.

"Other building needs have developed since the adoption of the Ten-Year Comprehensive Building Program.

"Some minimum provision for buildings needed to meet 1928 university conditions is the least that the regents, in performance of their duty, can request.

"By refraining from any attempt to build in anticipation of collegiate growth, by eliminating all but the most urgent needs, and by spreading over another ten-year period the construction of the buildings actually needed today, *the allotment, which has hitherto been \$560,000 a year, can be reduced to \$300,000.* The projects which are herewith listed do not by any means include all those which would be and should be listed in a long-time program for the development and expansion of the usefulness of the University. These projects represent matters of more immediate interest."

The 1929 Legislature, after reviewing the statement of building needs, submitted by the Regents, and after studying in detail the results of the 1920-29 ten-year building program, voted to make it possible for the University to proceed with another ten-year building program.

The first year, 1929-30, of the period in which the second ten-year program is to be carried out, falls within the time limits for which the present report is made. In that year the University, from funds already available, completed the third floor of the new Physics Building. An unusually generous provision on the part of the legislature, made it possible for the regents to issue certificates of indebtedness in anticipation of part of the receipts for the last five years of the new ten-year building program, and

the proceeds of these certificates of indebtedness, totalling \$300,000, enabled the University to complete by October 1, 1929, the Cyrus Northrop Memorial Auditorium, toward which approximately \$470,000 had been provided by gifts of friends of the University seeking to perpetuate on the campus the memory of former President Cyrus Northrop.

From the new appropriations for the biennium, 1929-31, the University constructed a physical education building for the Northwest School of Agriculture at Crookston, a physical education building for the West Central School and Experiment Station at Morris, an addition to Institute Hall at the Northeast Experiment Station at Duluth, and prepared the plans and specifications for construction of the new dentistry building and of the new nurses home.

During this period, provision also was made from funds derived from other than state sources, for the construction of the first unit of the new group of men's dormitories.

The most pressing building needs listed in the statement of the regents to the 1929 Legislature, which now remain to be provided for from the remainder of the appropriations to be made under the 1929-39 ten-year building program are the Dentistry Building (under construction), the nurses home (under construction), the building for a School of Business Administration, forestry building, a training school for the College of Education, adequate quarters for the Astronomy Department, a building for general classrooms and study halls, additional greenhouses, an adequate poultry plant, a mechanical engineering laboratory, an addition to Millard Hall, an addition to the Anatomy Building, an addition to the Home Economics Building.

The Regents in requesting a new ten-year building program for the period beginning July 1, 1929, asked for some provision not only for the construction of buildings, but also asked for money for the purchase of land. During the year 1929-30, the University was fortunate in being able to purchase additional land adjacent to the University campus, to provide space for military drill and for student recreation.

The most pressing needs which still remain to be met are: the farm campus could make excellent use of at least one hundred twenty additional acres, near the present Farm campus, to replace

land now rented for experimental purposes. The Grand Rapids Experiment Station could use an additional fifty-seven acre tract. Additional land is needed adjoining the main campus to provide for the ultimate development of the Medical School and the College of Dentistry, for possible future expansion of the hospital, and for dormitories.

The statesman-like provision made by the legislature for the consistent development of adequately co-ordinated building plans at the University has been and continues to be a challenge to the regents and to the administrative officers of the institution. Increases in registration and the development of pressing needs, require supplementary building facilities and may, from time to time, force the University to seek for additional provision for the construction of buildings and the provision of land, over and above that which can be undertaken within the limits of the \$300,000 per year, made available under the ten-year building program. But the campus of 1939, in its harmony, beauty, and usefulness, will stand as a monument to the men who were willing to provide the means for working out plans which could be realized only over a twenty-year period.

INTERNAL CHANGES IN THE EDUCATIONAL PROGRAM

It is a well-recognized fact that the influx of students following the war brought a number of problems to university administrators for which they were not prepared. Not numbers merely but an increase in the types of minds represented in the student body were factors creating these new problems.

But there is another set of conditions that accounts for some of the problems. Everywhere throughout life there has been an increasing tendency toward specialization. People have demanded more and more expert service. This specialization has been carried to such a point in life that specialists have found it necessary to combine in assembling an automobile or in diagnosing a human ailment. There has been a corresponding differentiation going on in educational circles. There has been a splitting off from the more general subjects until today it is practically impossible for one to secure an overview of any field or to get that

general background and fundamental training which is necessary for a liberal education.

All sorts of educational experiments are being tried in America with a view to correcting this situation, or at any rate of finding some satisfactory solution for it. There is the so-called Wisconsin or Meikeljohn Experiment; there is the Yale Institute of Human Relations.

In a number of institutions of learning new buildings have been erected in which men who are in different departments but whose work does bear or should bear intimate relation to that of others are located. It has been believed that the bringing of men into close personal relation will tend to break down the departmental walls that separate them. There is a strong tendency, even in educational circles, for men to fight vigorously and aggressively for the preservation of their principalities. This is not always good or wholesome at least so far as the welfare of the students is concerned.

At a number of institutions of learning there is a pronounced tendency to consolidate departments. In one of the smaller colleges of this state, twenty-two departments are being consolidated into five or six. The University of Cincinnati, the University of West Virginia, and a number of other institutions are reorganizing their whole educational program into a small number of divisions. The University of Chicago is proceeding upon this basis. The names of these divisions naturally vary. A typical illustration would be for a university to organize itself into the following divisions: division of health, division of arts and sciences, division of physical sciences, division of technological sciences. Some other classification might do just as well except that those units that are placed in a given division should be units that would bear some relation to each other.

The leaders of the various fields of learning are gradually recognizing the danger of extreme specialization. Law schools, for example, have been adding professors of economics, political science, physics, and the like to their staff, in order to give some more general training to young lawyers. Medical schools have been requesting the appointment of biologists, chemists, biochemists, botanists, psychologists, and even educationists to their staff for the same reason. Yale, for example, is proceeding in still an-

other way and has attempted to cut down the time required for medical education. She contends that in the last four years she reduced it 50 per cent and she has introduced into the medical program a number of general courses in the fields of history, political science, modern politics, and so on, recognizing the fact that every doctor will not be only a doctor but a citizen of the community, of the state, and of the nation and that he will be called upon to assist in solving all sorts of social and political problems.

There is still one other reason that is responsible for a weakening of college and departmental lines. All research, or practically all research, in the past has been personal or individual. Men worked alone, in isolation, over their test tubes and their retorts; they worked in secret within the four walls of their own laboratories. But the same thing is happening in research that is happening in the practice of medicine. Men can no longer work alone; the botanist must have the assistance of the chemist, the biometrist, and even the biologist. In other words in between the various specialties there are great areas of undeveloped resources. Apparently the most significant, as well as the most alluring, problems awaiting solution lie in these overlapping areas. While there will be cases of isolated research in the future, it is true nevertheless that there will be more research of a co-operative character, where individuals of allied departments work together in the solution of a given problem, than ever before.

The University of Minnesota has recognized this situation and has given much attention to it in recent years. Already steps of an experimental nature looking to a solution of the problem in certain fields have been taken. One of these steps consisted of the establishment of a committee known as the Committee on Co-ordination. The letter accompanying the appointment of this committee reads as follows:

March 4, 1930

To the Deans:

At a recent meeting of the Administrative Committee of the Senate a vote was taken for the purpose of creating a committee to study the educational program of the University with a view to simplifying it, removing administrative difficulties, and effecting a consolidation of offerings which will insure a more liberalized and coherent educational procedure than is possible with the emphasis now placed upon the various specialties. It is clear to practically every one that the need for drastic action in this respect

was never greater than it is now. Knowledge has been so split into departments and courses, and specialties have been so emphasized, both inside and outside of college circles, that it is practically impossible for a student to have an overview of any field or even to have reinforcing views from fields allied to his major interest. Colleges are still expanding, departments differentiating, and professors offering new courses. Academic men are interested in preserving control over their academic principalities and department heads believe that recognition depends upon expansion. I firmly believe that this situation is one of the explanations for public discontent with higher education. Whether any college or university really possesses the courage to modify its administrative lines, to create new academic relationships, to co-ordinate allied departments,—is an open question.

There is abundant evidence that fundamental changes are being contemplated in the liberal arts field and that the professional schools are finding it necessary and advisable to supplement their offerings with a view to giving their graduates broader training. Not only is that true but new types of co-operative arrangements are being announced almost daily between professional schools and the other departments of the universities in which they are located. Law schools, for example, are providing law training for men entering business, engineering, and the like; and medical schools are adding to their staff biologists, chemists, physicists, and botanists. These are simply illustrations of the general trend, indicating that forces are at work looking to the training of new types of specialists and the broader training of all types of specialists.

The vote of the Administrative Committee of the Senate calls for the appointment of the following persons on the committee to consider this matter:

Dean G. S. Ford	Dean M. E. Haggerty
Dean J. B. Johnston	Dean E. P. Lyon
Dean Everett Fraser	Mr. J. C. Lawrence
Dean W. C. Coffey	

This group is requested to meet following the next deans' meeting to organize itself for the purpose of studying this problem.

L. D. COFFMAN, *President*

The very first recommendation which this committee made resulted in the Board of Regents, on June 28, 1930, adopting the resolution referred to on page 18.

This recommendation is far reaching in its effects. It gives the president of the University the power to appoint a committee drawn from the various faculties of the University. This committee shall have the power to map out programs of instruction for deserving students without regard to existing college requirements and to recommend that these students be granted appropriate degrees. We have known for some time that students have

been caught in the network of the administrative machinery of the institution. We have known that certain students of ambition and ability are being deprived of the privilege of carrying the work they desired because of institutional requirements and while these requirements were right in the main they were wrong in certain cases. It has been difficult to change these things because they grew out of experience; they represented the actions of the various faculties and in the main were wise. But now under this new plan, it will be possible for the University to carry on experimentally the mapping out of programs of an individual character, disregarding college and departmental lines. These programs, of course, will be mapped out by committees consisting of persons from related fields whose judgment should be available in connection with any given program.

An example of what may happen will perhaps make the situation clearer. A young woman with two years at Vassar applied for admission at the University of Minnesota for the last two years of work. She is a very intelligent young woman; her record at Vassar was satisfactory; she knew exactly what lines of work she wanted to pursue at the University but it was not possible under university regulations for her to get this work. She desired to have the bachelor of science degree. She wished to take work in chemistry, botany, physiology, and other sciences; particularly, however, did she wish to carry a full major in veterinary medicine but she did not desire to have the doctor of veterinary medicine degree. A committee consisting of representatives from the various sciences, including veterinary medicine, worked together in the mapping out of a consistent program for this young woman which will give her the kind of training which she desires and which she should have in view of the things she expects to do in later life.

In other words, this resolution gives the University of Minnesota for the first time the opportunity of considering the needs of the students, of arranging programs to correspond to these needs, of articulating them into an educational whole which will be liberalizing on the one hand and specializing on the other, if that seems desirable. It means that the University will forget administrative rules and red tape and adjust itself to the capabilities, the responsiveness, the ambitions, the hopes of students. It is not

expected that this plan will be revolutionary from the outset. We shall feel our way, moving slowly and cautiously for a time.

Now another step which is being taken is that of expanding and liberalizing the law course. The Law School faculty filed with the regents a communication outlining its views with regard to this matter. An expanded summary of this communication is contained in Dean Fraser's report. The gist of the plan is that it provides: (1) that six years of university work be required for the degree of bachelor of laws of all students entering the Law School after March 1, 1931, the work to be apportioned to liberal arts and law as the faculty of the Law School may prescribe; (2) that the degree of bachelor of science in law be conferred upon students who complete two years of work in liberal arts and two years in law, under such regulations as the faculty of the Law School may prescribe.

It is clear to us at the University of Minnesota that at least two lines of development will be pursued during the next ten years in the reorganization of higher education. One will be the line which will be represented by the junior college with a cut-off at the sophomore year. There will be a definite break between the sophomore and junior years; a degree of some sort may be granted to those who finish the sophomore year. At the University of Chicago it is planned to take the freshman and sophomore years across Midway and locate them on the other side of the city, leaving the junior and senior years and the Graduate School on the present campus and organizing them in what will really be the University of Chicago. This movement has much to commend it. The junior college can become selective. It can help to pick more satisfactorily the students who should go on to enter the university proper. In addition it can have finishing courses, that is, courses that can be completed in one or two years. Furthermore, the separation of the junior college from the university may permit the authorities to carry on all sorts of experimental studies with freshmen and sophomores.

But there is another tendency which is equally significant and that is not to separate the colleges and universities into junior colleges and senior colleges but to organize educational programs on the basis of the types of service which individuals hope to render society and in accordance with their ability to carry the courses. This would mean that some programs should be perhaps

two years in length, others three, four, five, six, seven, eight, nine, ten, or eleven years. If one really desires to train one of the world's greatest surgeons and has a person under his direction who has the ability to be such a surgeon, he would map out a program for him extending over a long period of time which would insure that kind of training and the possession of those skills that are necessary to qualify him as such. If, on the other hand, he is to be a general practitioner of medicine and he does not possess the ability to render distinguished service but still has sufficient ability to render satisfactory service, one would map out for him a shorter program. Four-year college programs are simply a fetish before which the college world bows. There is no reason at all why they should not be completely disregarded and why programs of greater or lesser length should not be organized corresponding to the ability of the prospective student, and to the ambition, the hope, and the size of the economic return which he has a right to expect.

Already programs of less than four years in length are entering many of our universities. We have them in the library field, in pharmacy, in nursing, and the like. It is true that they no sooner get established than their advocates desire to expand them into four-year programs because they think that is the only way of entering the academic heaven.

The outlining of such programs will call for a weakening of college lines. To be specific, there will be developed co-operative programs between engineering and business. There are many persons, for example, in engineering who do not expect to be engineers but who desire a certain amount of training in business in order that they may carry on certain types of business satisfactorily. Likewise there are persons in business who wish to have, and should have, certain training in engineering. There are persons in the school of business and in engineering who should have certain courses in law. Not that they expect to be lawyers but because this legal training will be of direct assistance to them in the practice of their profession.

Students now register in colleges. I should not be at all surprised if the time is near at hand when students will not register in colleges at all but in the university for a given course or curriculum leading to such and such a degree. I look forward to the time when there will be developed at the University, faculties of

various kinds which will be interested solely in the organization of educational programs leaving the administration of the University largely to other officers. Most of us know now that if we were starting new we would have few, if any, colleges; we would have faculties composed of men from allied fields. It is also my opinion that existing college faculties will remain intact during the long period of trial and experiment with these changes.

A good illustration of how this plan may work is to be found in the fields of health education. We now have schools of medicine, schools of dentistry, and schools of pharmacy, all of which are differentiations from the same parent stock—at one time they were all parts of a single program. Each of these has now reached the point in its development where it recognizes that it must include in its program certain work in chemistry, in biology, in biochemistry, in biometrics, and even in psychology. At one of the large universities where a reorganization of a drastic character is in process, there is being created a division of biological sciences including medicine, with a dean in charge. This is significant. It leads one to ask whether or not the time is far distant when a committee consisting of representatives of medicine, dentistry, pharmacy, biology, botany, biochemistry, and even veterinary medicine, may not be created with a director or a chief in charge, with the understanding that this committee will devote its energies to the preparation of correlated programs in the interest of the better education of students and for the purpose of stimulating and directing co-operative researches.

Some such organization as this in many fields will be necessary to break down the interinstitutional and departmental jealousies that naturally arise through a desire on the part of the staff to preserve their prerogatives. When men become more interested in jurisdictional responsibilities than they are in educational procedures then the institution suffers. Every large university is to a greater or lesser extent at the present moment facing the problem of stimulating interest in teaching and in research—that is, in education and in a weakening of the interest that exists in jurisdictional responsibilities and procedures. Education is unselfish but administration tends to become selfish.

So that at Minnesota we are looking forward to continuing in the future many years of careful, consistent, common sense experimentation to insure sounder educational procedure, closer co-opera-

tion of the various administrative units of the University, with a view to outlining programs of instruction which conform to the needs of the times and to the abilities, aspirations, and interests of the students.

THE ALLOCATION OF FUNCTIONS

There is in America a marked tendency for all higher institutions of learning to duplicate each other. Hitherto institutional respectability has seemed to require this. And yet in this very tendency there is a weakness, if not a menace, to American education. It could easily be shown that the refusal on the part of higher institutions of learning to consider the allocation of functions results in inefficiency and in mediocrity. Not all of the colleges and universities can be distinguished in everything and it is extremely doubtful if any of them can be distinguished in everything.

Throughout America one can find an enormous duplication of work and of effort in the universities. Some of it is both socially necessary and desirable; that for example which produces training in the essentials which an educated citizenry should enjoy, but that which is dedicated to special fields of learning and to limited sections of knowledge would prosper more if it were by agreement concentrated in fewer places. Research in limited fields and sections of learning and knowledge could be carried on in a few places, the several institutions co-operating rather than competing as at present.

A few illustrations will make clear the lack of national and state policy with regard to this problem. The Federal Government has made grants from time to time for the promotion of higher education. These grants have often been made and certainly they have been distributed on artificial bases that had little or no relation to need. Money has been distributed for agricultural and engineering experiment stations in the form of an equal sum for each state. The same practice in general has been followed with regard to the distribution of other money for the promotion of other types of research or education in which the Federal Government is interested. In other words, this money is distributed to states without regard to whether or not they pos-

sess the conditions necessary for its wise expenditure. A typical illustration will suffice.

Washington and Idaho receive practically the same amount of money from the Federal Government. The land-grant college in Washington is located eight miles from the University of Idaho. Each of them has all of the departments that a college of agriculture is supposed to have. Each of them maintains a school of forestry and each of them maintains a school of mines. They are trying to serve the same agricultural, forest, and mining area. Neither of them can be distinguished because funds are spread out over too many courses and departments. If it were possible, under federal legislation, for Idaho to limit her functions to certain fields and Washington to limit hers to still other fields and if these institutions were required to co-operate in this respect, abler men in these limited fields could be secured at each of these institutions and the whole area which the two universities are supposed to serve would profit thereby.

How many schools of forestry or how many schools of mining or how many genuine agricultural experiment stations this country actually needs the country has never really dared to say. The states have gone on accepting the money which the government has handed them even though they may not have possessed facilities competent to carry on high-grade research. In other words, the money has not been distributed to the men who have already demonstrated their fitness and ability to do or to direct the research work which our national welfare requires. As a matter of fact, many of these men may not be in state institutions at all; they may be in private universities. It has been the general practice and policy of the Federal Government to distribute its money to public rather than to private institutions. The consideration on the part of the national government of the allocation of functions and the distribution of money according to areas and according to the location of men competent to carry on research, would result in a wiser expenditure of money. A few centers, thoroughly equipped, and unusually well staffed will produce more in the long run than a large number of centers inadequately equipped and poorly staffed. It may be said that federal money has been distributed partly for the purpose of stimulating research in certain areas, but research cannot be stimulated in this way.

It is possible to build a building and to equip it and to call it an institute of research of some sort, but it takes brains, and that means men of long years of training and experience who have the urge to discover new things to produce research. Now and then there may be an isolated case of a man of such ability located at some one of these more remote experiment stations. They would be found in greater numbers, however, if the experiment stations were consolidated and if the problems upon which they are at work were related to the interests of wider geographical areas. In other words, the Federal Government, if it desires to have its money used to promote the common welfare in a most effective manner, should disregard state and political lines and arrange for its distribution on the basis of the common problems found in given areas and regions.

Not only has the Federal Government failed to exercise foresight and wisdom in the distribution of money for educational purposes but the states themselves have perhaps been equally derelict in this matter. The distribution of federal moneys has been controlled largely by politics rather than by educational needs. The appropriation of state moneys has been controlled to a very large extent by local pride and prestige. It has been assumed that one state could do as much as any other and that it should provide all of the types of education that any other state provides. In other words, there has been a struggle on the part of the states and on the part of the institutions representing the various states to insure academic respectability—an academic respectability consisting in the number and variety, rather than in the quality, of offerings. It is clear to those who are in most intimate contact with the state universities of this country that none of them can become distinguished in everything. It would be the part of wisdom for those institutions located in a given region to join in outlining their programs, in defining their functions, and in allocating their responsibilities. To be specific, the state universities at Illinois, Iowa, Ohio, Michigan, Wisconsin, and Minnesota might agree that Minnesota should become the great library center for the Scandinavian cultures and all these other institutions should assist the University of Minnesota in becoming such a center. They might agree that the University of Michigan should become a great center for the Romance languages and all the other institutions should assist Michigan in becoming such a center. If this

plan were followed and extended, each of these universities might become the leading library center for some one of the great fields of learning. Each of these universities would, of course, have in its library all of those books and pamphlets and other materials which are necessary for undergraduate instruction and for the common culture of people everywhere.

Again, it would seem that co-operation in carrying on experiments of direct interest to agriculture is possible. There is already considerable co-operation in this field. It is doubtful, however, whether the large-scale stock feeding experiments are necessary at Wisconsin, Minnesota, Ames (Iowa), and Illinois; at any rate it scarcely seems that they would need to be carried on simultaneously. Experiments of this sort require large sums of money. It should be possible for those who are interested in the stock feeding experiments at these various institutions of learning to be constituted into a co-operating committee with the understanding that the various members of this committee would direct the experiment and check all the results. What has been said with regard to stock feeding applies with equal force to poultry raising, to the various aspects of animal industry, to the study of plants and insects injurious to crops, to the diseases of animals, and the like.

If this plan were extended, it is conceivable that institutions would send students who have received certain fundamental training to each other for more advanced training. It is conceivable that the states would provide scholarships which would enable them to send men from Minnesota to Wisconsin or Illinois or Iowa for certain training, while Wisconsin, Illinois, and Iowa in turn would send certain men to Minnesota for certain training. Such a plan as this would not only insure a better and higher grade of scholastic work, but it would promote and encourage research, it would insure greater permanency on the part of the staff and there would be less bidding among the institutions for members of the staff and it would at the same time enable the institutions to pay the abler men more than they are now receiving, for with the limitation of functions and fewer offerings some money could be released which could be used to improve the quality of the staff.

Some of the private universities have already appointed committees to consider this very matter. I know of one group of

institutions that has appointed a committee of research in the various medical fields with a view, not to confining absolutely, but to emphasize to a greater extent than hitherto, the researches to be carried on at each of these institutions. For example, one of them may become the cancer center, another the eye, ear, nose, and throat center, and so on. This means that the private institutions associated in this manner will not be appealing to the same sources for funds for the same purpose.

Whenever the colleges and universities of America free themselves from the fetish of respectability which requires them to offer instruction in everything; when they cease to compete for the purpose of salving their consciences; when they decline to appeal for money because someone else has something; when they discard that selfish tradition to which they cling and before which they worship—a tradition that those are best which present the greatest variety of offerings—then college and university instruction in America will be conducted more nearly in the interest of public welfare. But such times are not likely to arise among the colleges and universities of this country until there is a public opinion which encourages them to do so. Whenever the public is able to rise above state lines, whenever its legislators refuse to think of the political consequences of their acts, then the universities will receive that encouragement, sanction, and support that they should have in carrying out the kind of program which is herewith outlined. It is my opinion that the next ten years or less will see many steps taken in this direction.

EXPANDING THE STATE'S ENDOWMENT

The needs of our state-supported higher educational institutions call for more money. The private institutions of America are receiving endowments, every year, running into millions. In addition they are receiving large gifts for other purposes which enable them to expand their functions. The total gifts for two of the great private universities were in the neighborhood of twenty millions of dollars each during the year 1929-30. If gifts of this sort continue with their attendant improvements in facilities and the release of scholars from administrative responsibilities and statistical forms of drudgery to which they may be subjected in the prosecution of their researches, there will inevitably be a con-

centration of talent at such institutions. Men will go where they are best paid and where the conditions of work are most satisfactory. Appeals to their sense of loyalty will not hold them when institutions are unwilling or unable to reward them.

It may be said in justification of the concentration of wealth and talent in a few places that science will not suffer as a result of it but on the contrary will be promoted. There is, to be sure, a certain amount of truth in this statement. On the other hand, it should be remembered that scientific stimulation comes, not merely from the contact of men of similar intellectual aspirations and ambitions, but from the contact of men with the situations and problems of life. It is difficult to believe that men who are disassociated from actual day to day stimulations arising out of our complex agricultural situation, will be sensitive to the vast number and kinds of investigations which should be carried on in this field. It is difficult to appreciate or understand how men who are remote from the changing character of our small towns and rural communities will be sensitive to the influence of problems arising out of improved means of communication, the establishment of chain stores, chain banks, chain creameries, and the like. Whether one is working with a social, political, or industrial problem or with one in the fields of so-called pure research, he should work—indeed he must work—where the conditions and materials are if he is to work intelligently and effectively.

Furthermore, it must be true that the country needs not a few, but a considerable number of, centers of graduate study where some of the best minds will be assembled. The stimulating effects which may flow from these minds to the university staff in general, the direct benefits which will accrue to the people of the region in which these institutions are located, and the opportunity for scholars to perpetuate their own kind—that is, the training of their own successors—are matters of great importance to every section of the country.

Perhaps not all of the state universities of America can become truly great; some of them can; but they cannot unless the people of their respective commonwealths deliberately outline a policy of support which will insure vastly greater funds in the future for their operation and maintenance than they have received in the past. These funds are needed because everything costs more

than it did a few years ago; books, equipment, buildings, staff are all more expensive than they have ever been, and furthermore, the number and types of problems which a university is called upon to investigate are constantly increasing. I have on my desk at the present time research projects which would call for an expenditure of more than two million dollars. Many of these, in fact most of them, are projects which would contribute directly, if the solution could be found, to increasing the wealth of the people of the state. Those which do not contribute directly to greater productivity would contribute to increasing the comforts of life and to enhancing its values. If these problems could be solved in whole or in part the returns the people of this state would receive from them would in a very short time amount to tens of millions of dollars.

Now it must be perfectly clear that most states will never feel that they can spend such large sums as this in any year or biennium over what they are now spending for the support of their universities. Constant effort to prevent increased taxation, the tendency on the part of the politician to capitalize on this, the inability of the scientist to make clear the tangible results that will flow from his investigations, the feeling on the part of some that money spent on research is wasted and that those who constantly urge large appropriations for this purpose are impractical dreamers—all these are factors which make it difficult, if not impossible, for state universities as they are now financed to secure the funds which they must have if they are to keep step with progress and are to improve the conditions of their constituents.

It is my opinion that states should set out deliberately to provide endowments of large sums out of their own resources for the maintenance of their universities. There is nothing new in this policy. Both the federal and state governments have provided endowments for the University of Minnesota.

There are those who maintain that this policy would make the University independent of public control. I think it should be remembered that the constitution of the state maintains that the University is an agency directly responsible to the people of the state. As such it should be required to account to them for the uses it makes of their money. Every two years it should be required to file a comprehensive and detailed report with the legis-

lature showing its sources of revenue and its expenditures, and on the basis of this showing, the legislature should grant or withhold the biennial income from the endowment. And also on the basis of this showing, the legislature should consider requests for allotments in addition to the income from the endowment. At no time should the University, in my opinion, be independent of this relationship.

What is here proposed is that the people of Minnesota shall continue to take steps to provide a large permanent support fund for the University. This would reduce the University's requests for maintenance from current taxation, without any lessening of the people's control of the University. By transferring to the Permanent University Fund some part of the state's income perhaps from a hitherto untouched source of state revenue, the legislature would lessen steadily the University's claim upon the proceeds of state taxes now levied, which then could be used more and more to strengthen the support of the various arms of the state's government.

The University seeks no part in governing the people of Minnesota and makes no claim to consideration as a portion of the machinery of government. There would be distinct gains for all of the people if the major needs of the state's higher educational program could be met without setting them up to compete with the needs of the state's government for the state's current revenue.

In building up further endowment for the University of Minnesota, the legislature could provide that the sums set aside to be added to the Permanent University Fund would be added to that fund for a definite period, subject to reconsideration of the existing needs for state's funds at the expiration of that time. The legislature could provide also that the income from this fund would be available for university current operations *only* as voted each two years, for biennial periods, by the legislature. The University would give an accounting for its operations and submit its needs to the legislature each two years just as it does now. The legislature would determine the extent to which money should be voted for support from the permanent fund income.

Congress, in granting land to maintain the land-grant colleges, and the Legislatures of Minnesota of 1921 and 1923 in making provision for a share of the occupation and royalty taxes on ore to be covered into the endowment fund, went much farther in

providing for the unrestricted support of the University than is suggested in this report. It made the income from the "Permanent Funds" available for the support of the University in perpetuity without biennial legislative action. The plan here suggested for providing the balance of an adequate university endowment fund contemplates no locking up of the state's wealth in perpetuity. Furthermore it provides for legislative regulation of the University's demands upon the revenue derived from the proposed additions to the Permanent University Fund.

What, if anything, will be gained by a state endowment of one hundred million dollars for the University?

1. Assuming that the income from the endowment may never be large enough to provide for the total support of the University, it will assure the University, in so far as that can be done, of a definite amount for its annual support, without affecting the tax rate.

2. A definite income of a fairly permanent character will permit the University to plan more effectively and more intelligently for the work it is expected to do and for the services it is expected to render.

3. The consideration by the legislature of what should be done with the income from a fund that does not affect the annual tax rate, can be undertaken by the legislature solely as a body of trustees seeking the best possible use of the people's higher educational revenue—revenue which can be added to the Permanent Fund if really pressing reasons for spending the money do not exist. This would be a different attitude from that which necessarily accompanies the consideration of what is to be done with an income that is directly dependent upon annual tax rate.

4. Anxiety and questioning, on the part of many, have accompanied recent increases in the amounts required for the support of state universities. This is particularly true of those charged with the management of some of the state universities. They note, for example, that several of the privately endowed institutions are being more and more liberally endowed; they recognize that, if this continues, these institutions must inevitably become the centers of higher learning in America. They note at the same time that a few of the state universities are being far more generously supported than others by their respective states; so that each state is now being forced, by the very circumstances of the situation, to

decide whether it wishes to have a first class, a second class, or a third class university. Most states will not and cannot maintain first class universities if they rely wholly upon appropriations raised by taxes from year to year.

5. Each generation goes on expanding old institutions and creating new types of institutions on the assumption that succeeding generations will be able to provide new sources of wealth to support them. New wealth may not be as easy to obtain in the future as it has been in the past. With our forests cut, our mines exhausted, and other sources of natural wealth depleted (because we thought more of ourselves than of the future) the next generation may find that it must supply its wants by relying upon ingenuity and science rather than upon bounteous nature, and science is becoming increasingly more expensive. It is sound policy and sound statesmanship for each generation not to draw upon its capital assets for current operations or expenses. Rather, when a state's natural resources are turned into money, should the proceeds be set aside, permitting only the income to be used under the shifting conditions and changing times of a progressive society. An endowment makes provision for future growth. It is the best evidence of the unselfishness of the present and of its desire to transmit a worthy social inheritance to its offspring.

6. If funds slightly less than, or approximating, the minimum support of the University are available from year to year from endowment, then both the University and the state can and will give more consideration to those special forms of research and state service that progress requires. So long as the legislature must provide from general state income funds to meet the University's current expenses and to provide for its ordinary necessities, there will be little money available for productive research. Once the current needs are well provided for (without imposing an obligation upon the current tax rate) attention can and will be given to a wide variety of problems in agriculture, mining, medicine, and engineering, the solution of which will contribute to the wealth of the state. And, as the people want it, an increasing amount of attention can be given to the fine arts and the humanities so necessary to the welfare of a civilization.

7. A liberal endowment of the University by the state will encourage more generous gifts by individuals. If the state has an increasing pride in her child, the people will have an increasing

pride in her also, and they will come bearing gifts for her enrichment and development.

The amount and the quality of service which an institution can render depends upon its support and upon the pride with which its supporters, with adequate grounds for that pride, have in it.

These are some of the reasons why the state should set itself the task of creating an endowment for the University.

PRIVATE GIFTS

The attempt to build up a large endowment for the University over a period of years should in no wise discourage private individuals from giving money. If men of wealth will join with the state in providing out of their resources for the development of the institution and the maintenance of certain projects, and if this is done on a sufficiently generous basis, we can have here at Minnesota one of the greatest universities of all times. If the examples of Dr. Mayo, Dr. Elliot, Mr. Eustis, Mr. Murphy, the Citizens Aid Society, and others are followed with increasing regularity in the future, the University can and will, in the course of the next decade or decade and a half, be placed in a position of distinguished eminence among the universities of the world. There is a constant stream of small gifts coming to the University. These, when combined with the larger gifts which the institution has received, now provide a trust fund of \$10,521,971.37.¹ This fund should be quadrupled from private sources. Money should be available so that we could gather here great collections of books, great collections of plant and animal life; there should be a museum of art, of natural history, and of industry on the campus of the University. Traveling professorships should be endowed, traveling scholarships should be created, money should be made available to continue at the University, from one to five years, exceptionally brilliant young men who have completed the requirements for the Doctor's degree and who are engaged upon researches that are as yet unfinished but who will leave the University to go elsewhere because they must live and the University cannot provide for them. Money should be made available for expeditions in the interests of science, archaeology, anthropology, and the like. Money is needed for special types of equipment for the prosecu-

¹ Endowments and trust funds as of June 30, 1930.

tion of the highly technical studies. A fund should be created for publications; a fund should be created for the dissemination of literature, extracts, and articles of value to the various classes of people within the state. A fund should be made available for travel for members of the university staff; it should be possible to send them to the remotest corner of the world if the sending is likely to result in the improvement of conditions at home. A fund should be made available that the regents could use to pay certain of the distinguished members of the staff a salary beyond that which is normally paid so as to insure the continuance of their services here. Money is needed for the beautification of the campus; there is no reason, except lack of funds, why it should not be one of the most beautiful in the world. There are certain structures that are needed; a great union building for men and women students and for the various organizations of the institution to hold their meetings in, is highly desirable. A campanile with its chimes would contribute much to the life of the University.

We have no disposition to catalog all of the things for which private gifts should be made. In fact, we could not prepare such a list if we desired to do so for the reason that conditions are constantly changing so that some money should be kept in a fluid fund to meet these changing needs. The opportunities for giving that are listed represent constant needs of a never diminishing character for which private gifts may be made.

SCHOLARSHIPS FOR THE MOST PROMISING STUDENTS

It is natural that there should be a struggle among the higher institutions of learning in this country for students of talent and ability. The distinction of a university resides in a very real sense in the distinction of its alumni; the abler they are, the greater their leadership; and the more significant their contributions to human welfare, the greater the university becomes. Every university recognizes this fact and makes some effort therefore to attract students of a high mentality.

There is a feeling, in fact it is sometimes openly stated, that the intellectual leadership of America will come eventually from private universities. There money will be concentrated for research, professors of great attainment and unusual ability will be congregated, and students with ambition will go to such institu-

tions for their training. Those who make these statements sometimes dare to say that the state universities of this country may perform a useful service but they will never perform a distinguished service; they have less money, fewer professors of great attainment and ability, and fewer students with great intellectual ambition. They point to the fact that no state has as yet really become genuinely conscious of the quality of leadership which its university may exercise and should be called upon to exercise.

It is a fact, well known everywhere, that many of the private universities of this country have organized highly effective programs for the accomplishment of these purposes. They have not only done it in the matter of raising money but in offering scholarships to students of talent. These scholarships are not confined to the immediate communities or localities in which these institutions are located; they are national in their appeal and in their distribution.

The very day that I write this statement I read in the Minneapolis papers that Chicago University has offered a scholarship of \$600 to one of the leading graduates of the John Marshall High School. While attending a high school commencement in one of the comparatively small communities of this state this spring, announcement was made that the valedictorian had been awarded a scholarship at Harvard University. Not long ago an alumnus or a group of alumni provided a fund to be used for the creation of scholarships at an eastern institution, one scholarship to be available for each county of a midwestern state. It would be easily possible to continue this recital of methods which are employed by the private universities of this country and their alumni to attract capable students and to attract them from every part of the country. Nothing will ever stop this movement; indeed, it should not be stopped. Institutions or alumni that are conscious of its importance are entitled to the highest commendation. It is healthy for a state to have men and women coming into it who have been trained elsewhere, and it is healthy for a state to send some of its young men and young women elsewhere to be trained. A state that attempts to limit its enrolment at its university to residents of the state would soon become mediocre and provincial in character. Every university is to a certain extent a national university—or should be.

On the other hand there are two things that should be remembered with regard to this movement. The first is that many of the students who are trained elsewhere never return to the states that gave them birth and provided for their preparatory education, for the practice of their professions, or for the pursuit of their careers. Having been educated elsewhere and having made friends elsewhere, they live elsewhere. This shift of intelligence is socially desirable but there is a limit, beyond which the state receives diminishing returns from it.

A second thing which deserves to be remembered is that after all only a very small percentage of the talented and capable students are now selected by the various agencies in existence for college or university training. In Minnesota, for example, the studies which have been made in co-operation with the Association of Minnesota Colleges, show that in any given year we have approximately 1,600 high school graduates in the upper one third of the college ability curve who do not expect to attend college. Many of them are unable to do so because they lack funds. If this group is properly trained their potential contributions to the welfare of the state would be enormous. If untrained, the potential loss to the state is equally enormous.

England, Australia, New Zealand, in fact, the various countries under British rule, long ago recognized the importance of appealing to those in the upper intellectual levels. In England, for example, all sorts of scholarships are provided—some by private individuals, some by local clubs or organizations, many by local municipalities, many by the central government, and many by the educational institutions themselves. There is a constant and continual sifting of students step by step and from level to level. It is not uncommon for a student of unusual ability to have two, three, four, or even five scholarships when he has clearly demonstrated a high degree of superiority.

It has long seemed to us at the University of Minnesota that here is a field to which larger contributions of private fortunes might be made. It is a field to which local service clubs might devote more attention. Municipalities might even find it possible to establish a limited number of scholarships for young men and young women of talent. When one bears in mind that there are in the state of Minnesota approximately 1,600 high school graduates of high college ability who do not plan to attend

any college or university here or elsewhere, and many of these most promising students are barred from further study by lack of funds or the need of social stimulation which comes from local encouragement and public recognition, we must recognize that failure to solve this problem not only means an economic loss but a permanent intellectual and social wastage.

In making this plea that in the future the people of the state shall give more encouragement to capable students to attend college, I do not for a moment mean to imply that the University shall develop any false notions of aristocracy or that those of less talent shall be denied the privilege of receiving the training which they need and from which they can profit. The educational program of a progressive university will not only be in keeping with the spirit of the times but it will be so modified as to conform to the objectives and the abilities of the various types of mind represented by the student body. To be sure, students who are incapable of carrying work on a level higher than that of the secondary schools, or who are unwilling to devote themselves seriously to the mastery of such work, should not long be tolerated within the university, even though they may be geniuses. But the thing that I am, for the moment, interested in is that there is a widespread movement—not highly organized but nevertheless quite as effective as if it were organized—for the drawing off from the top levels of our intellectual population many of the most capable and that there is no corresponding movement among our own people to attract university students of corresponding ability. It is a sad fact but nevertheless true that there are some who are far more interested in securing a prominent athlete than they are in securing a prominent valedictorian for the University. The University is frequently criticized—in fact it has been vigorously criticized—because it failed to solicit the attendance of some particular athlete. It has seldom been criticized, so far as I know, because it failed to solicit superior students to attend it. But the University does not solicit any students. It has regarded the solicitation of students by it as a more or less questionable practice. The rules of the University, as adopted by the regents, expressly prohibit advertising except in the case of the Summer Session and the Extension Department. It is the University's business to confine its activities to teaching and research and not to the gathering in of students.

A typical illustration of what I mean is this. Mr. Edison has established a series of scholarships, one for each state. Some young man interested in science was chosen last year by competition with other young men from the various states, and sent to the Massachusetts Institute of Technology. Mr. Edison is repeating the plan this year and perhaps will do it next year and may continue it for the next five or ten years or more. I do not know exactly how many young men from Minnesota competed for this prize; there may have been twenty or twenty-five and ten or fifteen of them may have displayed marked ability. Only one of them was chosen by Mr. Edison's committee. As a matter of fact, Minnesota did not win the scholarship at all but the ranking student of Minnesota was sent by Mr. Edison to some eastern institution. What happened to the other ten or twelve or fifteen students of fine ability? Nobody knows. What a wonderful thing it is that there is a Mr. Edison! But can anyone be assured that the student he selected will in the years to come be his scientific successor? May it not be possible that his scientific successor will be found among the ten or twelve or fifteen students residing here and there in our own state but who have lived and grown up under less favorable conditions than the one who was chosen to represent the state?

A deeper and more sensitive interest, a more conscious regard of the importance of providing educational privileges and opportunities for students in the upper intellectual reaches is one of the things to which the state as such, the various municipalities and communities, service organizations of the state, individuals and the alumni association—in fact, everyone—could give more attention in the future.

THE RETIREMENT PLAN

Sooner or later it will be necessary for the University to prepare a retirement plan for the members of the staff. Practically every reputable institution and educational association and scientific society of America now has one. The University of Minnesota has been fortunate in the main in recent years. Due to the fact that it has been on the Carnegie Pension List more than a third of a million dollars has been paid out by the Carnegie Foundation for the retirement of members of the staff of the

University. But the day is fast approaching when those who are eligible for this retirement will no longer be members of the staff of the University. New men have come on to take their places. No retirement protection is available for them. The fact that they can secure some form of retirement for themselves and a certain amount of protection for their families at other institutions of learning, tends to attract them away from the University of Minnesota.

Just what retirement plan this institution should adopt is a matter deserving of careful study. Since Michigan, Illinois, California, Colorado, and Alabama, as well as many other institutions both public and private—each has a plan—plans which are now in operation—and the University of Minnesota has no plan we shall be operating at a disadvantage.

RESEARCH

The number of unsolved problems calling for investigation is almost limitless. Many of these problems are directly related to material prosperity and productivity; others are concerned with problems in the various humanistic fields; and still others are little more than intellectual discipline.

I have on my desk now a large volume listing the types of studies in these various fields which, in the opinion of the deans and of the staff, the University should undertake. The reading of these projects is of great interest. Long before he has finished one feels that the solution of any considerable number of them would contribute largely to social progress. It is our intention, so far as funds will permit, to give consideration to these problems during the next decade. The wide variety and importance of the problems suggested is indicated by the following topics:

AGRICULTURE

Division of Agricultural Biochemistry

- Oil seed crops for Minnesota
- Fructose sugar and fructose syrup
- A simple water purification scheme for Minnesota farms
- Protein investigations
- Wheat storage investigations
- The mineral problems of livestock in Minnesota

Division of Agricultural Engineering

- Economic utilization of farm power and labor

- Artificial drying of farm products
- Optimum temperature for dairy barns
- Tile drainage index according to soil type
- Relation of livestock to brush control
- Division of Agronomy and Plant Genetics
 - Crop improvement
 - The breeding of disease resistant varieties of crop plants
 - Weed control
- Division of Dairy Husbandry
 - Mastitis in the dairy cow
 - The disposal of creamery wastes
 - Refrigeration on dairy farms
- Division of Entomology and Economic Zoology
 - Vegetable and greenhouse insects
 - Fur farming and game conservation
 - Improvement of honey bees
- Division of Farm Management and Agricultural Economics
 - The human factor in farm management
 - Marketing of farm products
 - Land utilization studies
- Division of Forestry
 - Selective logging in the coniferous forests of Minnesota
 - Improvement of nursery practice
 - The prevention of wood decay in wooden structures
- Division of Home Economics
 - A study of electrical equipment for the home
 - Nutrition studies on children
 - The significance of physical tests in the evaluation and purchase of textile fabrics
- Division of Horticulture
 - Breeding of vegetable varieties adapted to peat lands
 - Orchard nutrition studies
 - Apple breeding methods
 - Hardiness of ornamentals
- Division of Plant Pathology and Botany
 - Diseases of canning crops
 - Pathologic changes in fruits and vegetables in storage
 - Plant introduction and acclimatization garden
 - Weed control and demonstration plots
- Division of Poultry Husbandry
 - Malpositions of chick embryos in relation to embryonic mortality
 - Longevity in fowls
 - Low fertility in fowls

Division of Rural Sociology

The social organization of the farm family in Minnesota

Division of Soils

Effect of sweet clover and alfalfa upon yields of succeeding crops

Amelioration of alkali soils in western Minnesota

Acidity of red drift soils

Division of Veterinary Medicine

Anemia of young pigs, a disease which attacks the blood-forming organs
and the organs of circulation

Diseases of poultry

Parasitic diseases of sheep

BUSINESS ADMINISTRATION

Equipment needed for instructional purposes

University document room

Economic seminar room

Co-operative work

Equipment needed for research purposes

Needs for a new building

CHEMISTRY

The effect of light on nitrocellulose and its derivatives

Research in physical chemistry and spectroscopy

Institute of cellulose chemistry

Study of heat transfer

Corrosion

ENGINEERING AND ARCHITECTURE

River and power hydraulics

Stresses in engineering materials and structures

Field tests of concrete and steel buildings

Schoolroom heating and ventilation

Improvement in home construction

Lubrication of automotive engines in cold weather

Rural electrification problems in Minnesota

MEDICAL SCHOOL

To strengthen the Cancer Institute

To strengthen the service in general medicine at the University Hospital

To strengthen service in surgery, University Hospital

MINES AND METALLURGY

Research on the fatigue or endurance limits of metals and alloys

Properties of metals at elevated temperatures

Electrometallurgy

Field work on the Minnesota iron ranges

Publication of the *Mining Directory*

PREVENTIVE MEDICINE AND PUBLIC HEALTH

Proposed center for public health training adjacent to the University
Growth and development of the department

LIBRARY

Government documents department
Fine arts department
Library adviser service
Division of library instruction

PHARMACY

Research laboratories
Visual instruction
Graduate work

REGISTRAR'S OFFICE

Development of statistical work
Records reference department

EDUCATION

Expansion of present departments and addition of new departments
Research and publication
Service to the state
Research in higher education
Maintenance of an experimental school

SCIENCE, LITERATURE, AND THE ARTS

Pre-registration advising
Supervised study
Study in marking system
Speech correction
Promotion of scholarship and provision for special services

GENERAL EXTENSION DIVISION

Present and future possibilities of the University of Minnesota in the
field of "training for the public service"
An experimental investigation of radio education
Research study in the history of burial customs

ADULT EDUCATION

Through invention and science more material progress has been made in the last fifteen years than was made during the preceding three hundred. The coming of the machine has added greatly to the power of man. Today every man has the equivalent of approximately seventy-five mechanical slaves working for him, while in 1870 he had about three such slaves. The introduc-

tion of machinery has transformed our mode of living. It has greatly increased the productivity of men. In fact, it has carried it to such a point that today the whole economic structure of society is suffering from overproduction. It has led to the abandonment of the handicrafts and the disappearance of many of the arts and trades. It has created a permanent problem of unemployment. On the other hand, it is true that machines have created new trades and new occupations and that they have released men for the performance of thousands of other useful things.

There is really nothing new in the process of mechanization except that it has been speeded up. This speeding up, the American Federation of Labor estimates, means that 9 per cent of the wage earners of America will be out of jobs even when the factories are running with full speed and under the highest pressure. One person today produces as much yarn as 45,000 did one hundred sixty years ago; in the boot and shoe industry 100 machines now take the place of 25,000 men; in 1918 one man could make 40 electric light bulbs in a day; now a machine makes 73,000 bulbs in twenty-four hours—this means that one machine has destroyed 922 jobs; one crane in a steel mill now does the work of more than 40 men; a brickmaker made 450 bricks in a day; a machine now makes 40,000 bricks in a day. These illustrations, and others like them, mean that we are producing just one thing and that is a workless world for millions of displaced men.

While mechanization does create new jobs, at the same time it retires persons from jobs in other lines. The mechanization of highway transport has affected railway employment. Hundreds of passenger trains have been abandoned to be replaced, if at all, by gasoline motor cars. Electric lines for interurban service are now antiquated; the freight and passenger business they once did has now been transferred to automobile coaches. And so the story goes. It could be multiplied over and over with examples from industry. The displacement of men is seen and felt everywhere in every walk of life. The machine is increasingly building up a surplus of labor and a deficit of unemployment.

The physical machine displaces hand labor; the business machine or the great organization of capital or talent which is the counterpart of the physical machine, displaces brains. Theodore M. Knappen says:

It takes a big man successfully to conduct a small bank, the talents of a clerk are enough when it becomes a branch. A few bigger and better jobs at the top and center, filled by extraordinary men, result from consolidations; but the tendency is distinctly to lower the type of minor executives, repress their initiative, curb their authority, and convert them from leaders to cautious placeholders.

Similar forces are working in every field. We have group medicine, great corporations of lawyers, syndicate newspapers, chain stores, the group or chain banking system, and so on through a long list. A youth today whenever he goes out for employment in the business world is likely to secure a job that has all of the types of work already mapped out for him. He is not expected to make mistakes and profit by them; he is expected to do the work largely as he has been told to do it. He and all of his kind are in danger of developing a routine type of mind. Efficiency is the modern god before whom we bow in order that dividends may be paid.

Even in agriculture we find 800,000 persons have left the farm in the last ten years to work in the factories in the cities. The rural population is steadily declining; the city and industrial population is steadily increasing. It may be claimed that initiative and independence, those qualities which have made America, are as desirable today as ever. It may also be claimed that there are as many opportunities for them to be displayed today as ever, but the hard fact nevertheless remains that with standardization, mass production, long term and indefinite apprenticeships of a routine character, a permanent and perhaps increasing problem of unemployment, the increasing difficulty of men past forty or forty-five years of age to secure employment when displaced by industry, there are increasing thousands of persons in America who are anxious and diligently searching through education for some means of preserving their adaptability, of increasing their resourcefulness, and of opening to them new avenues of earning a livelihood. Many parents look upon a college education for their children as a possible means of salvation from the industrial order that is fastening its grip upon them. This undoubtedly constitutes one of the reasons also why so many adults are seeking some means of continuing their education.

But the movement for adult education, however, cannot be attributed entirely to a desire for emancipation from the indus-

trial order. This industrial order has brought more leisure than mankind has ever known. Men work fewer days per month and fewer hours per day than ever before, and it seems fair to assume that in the future they will work still fewer hours and fewer days per week and per month. Millions of persons are trying to find ways of satisfying their cravings during these leisure hours. Some have obviously resorted to sensual practices but the vast majority are doing more reading, engaging in more recreation of a wholesome character, and attending public meetings and lectures of one kind and another for their improvement. The thousand and one organizations, now in existence, are evidences that like-minded groups are seeking ways of improving themselves and the social order of their time.

There are more people than ever before interested in art with no thought of becoming artists, in music with no thought of becoming public performers, in sports with no thought of becoming athletes, in religion social service, public welfare, and education with no thought of becoming great leaders in these fields; not only more, so far as actual numbers are concerned, but more proportionately.

With their increased leisure men can, if they wish to do so, become slaves as abject to the industrial order as were the slaves of the old feudal order. Or they can use this extra time for self-improvement and social advancement. Opportunities for study, for travel, and the education of the masses through the distribution of literature and over the radio, lay the basis for intelligent discussion and thought on the part of the public. Men everywhere are asking more for facts and less for opinions, more for knowledge and less for emotion. There is less followership and more leadership on the part of the common people because of the agencies for mass education that exist.

In this situation lies the only hope of democracy, for after all, democracy is a process of continuous education. With the world becoming narrower, the avenues of communication becoming broader and the means speedier, and with the whole world as a possible auditor, the chances that democracy will survive have greatly increased. All this means that education has become a necessity for all of the people of the state. One of the important functions of the university has always been the dissemination of information and the development of its extension department

was a recognition or a beginning of the recognition of the movement for adult education. But that movement has gone far beyond the purposes which were responsible for the establishment of the extension department until today it encompasses everything that will contribute to human welfare.

It is through the processes of adult education that many of our most difficult problems will be solved, problems of capital and labor, questions relating to the tariff, agricultural problems, the conservation of our natural resources, the cure of human disease, the prolongation of human life, instruction in art, music, literature, the development of a cosmopolitan type of mind—all will be the ultimate outcome of the demand for adult education. It is true it will do a lot of other things in the meantime; it will teach the farmers how to avoid certain plant diseases, how to get rid of certain insects, how to feed their stock, how to judge their poultry, how to determine whether or not they are making their farms pay; it will help the baker, the grocer, the druggist, the teacher, the nurse—men and women of every walk of life. It will give the specific kind of help that men and women need in the discharge of their daily duties but it will at the same time give these larger conceptions which lift living during one's leisure hours from the plane of the sensuous to the higher lines of life. It will be practical and idealistic, constructive and imaginative.

It is my opinion that we shall give more, not less, attention to adult education, and that private agencies will co-operate with public agencies in outlining programs of this character.

It is amazing how many different agencies we have in the state of Minnesota that are now engaged in adult education and how many different thousands of persons they are reaching, and how many millions of dollars these people are spending for this education. There is a waste of effort, overlapping, inefficiency, lack of economy, poor instruction, no co-ordination—in fact, no state-wide program. It is my prediction that within the next few years in some states at least the various agencies that are genuinely interested in the upbuilding of the state will co-operate in outlining and promulgating a constructive program which will reach into every section of the state and which will minister to people of all classes and of all ages.

THE UNIVERSITY'S EXTERNAL RELATIONS

THE UNIVERSITY'S EXTERNAL RELATIONS

BOARD OF REGENTS

The territorial legislature appointed the members of the Board of Regents in 1851, 1853, 1855, and 1857. Seventy-two years elapsed before the legislature again elected the members of the Board of Regents. The supreme court decision of 1928, defining the constitutional powers of the Board of Regents, declared that the territorial act of 1851 was still in force so far as the selection of the members of the board is concerned. This act specifically states :

SEC. 4. The government of the University shall be vested in a board of twelve regents, who shall be elected by the legislature as hereinafter provided.

SEC. 5. The members of the board of regents shall be elected at the present session of the legislature and shall be divided into classes numbered one, two and three; class numbered one shall hold their offices for two years; class numbered two, for four years; and class numbered three, for six years, from the first Monday of February, one thousand eight hundred and fifty-one; biennially thereafter there shall be elected in joint convention of both branches of the legislature, four members to supply the vacancies made by the provisions of this section and who shall hold their offices for six years respectively.

SEC. 6. Whenever there shall be a vacancy in the office of regent of the University, from any cause whatever, it shall be the duty of the governor to fill such office by appointment, and the person or persons so appointed shall continue in office until the close of the session of the legislature, then next thereafter, and until others are elected in their stead.

Approved February 13, 1851.

It has been the conviction of those intimately associated with the life of the University of Minnesota, that the specific method of choosing regents is not nearly so vital a thing as the spirit in which those regents are elected or appointed. A good board of regents can be secured in various parts of this country under any of the generally practiced methods of selection. Bad boards can be secured and have been secured under the methods of selection which are supposed to be most conducive to the maintenance of high academic ideals.

Minnesota has been fortunate in the persistence of an almost universal popular determination that the members of the Board of Regents shall be chosen solely for their ability to serve the people of the whole state, as educational statesmen charged with the responsibility for operating and developing the commonwealth's highest public school. Political, religious, factional, or local considerations have been forgotten in providing for the perpetuation of the life of this board. No state university can present over a period of two generations, a more distinguished list of men and women who have served their fellow citizens in this capacity without compensation and without the slightest opportunity for personal reward.

The 1929 Legislature, regardless of misgivings in some quarters, proceeded to elect members of the Board of Regents in the spirit which characterized the appointments that had been made over many previous years by the governors of the state.

So long as the people of the state and their legislative representatives have their present high regard for the standards of the Board of Regents, any discussion of methods of choosing regents will remain purely a theoretical one.

However, since the choice of the regents by the legislature has led to much public discussion, it seems appropriate that an effort be made to find out what the prevailing practice is with regard to the powers, duties, and methods of appointing the governing bodies of the various state universities and colleges of this country. Dr. Fred Engelhardt, professor of educational administration, of the University of Minnesota, undertook this problem. The information which he has secured is of such general, as well as local, interest that it seems entirely appropriate that it be incorporated in this report. The discussion follows:

In the fifty-nine institutions studied (Table II) fifty-two per cent have boards with nine or fewer members, while sixty-nine per cent operate with nine or fewer voting members. One institution endeavors to carry on with a board of regents of one hundred members.

TABLE II
 NUMBER OF MEMBERS ON GOVERNING BOARD OF FIFTY-NINE
 UNIVERSITIES AND COLLEGES

Item	5														15 or More	Total Institutions Represented
	None	or	6	7	8	9	10	11	12	13	14	Less				
Number of boards having the number of ex-officio members indicated	22*		34	0	1	0	1	0	0	1	0	0	0	0		59
Number of boards having the number of other members indicated	0		9	4	6	8	14	1	2	3*	0	3	9		59	
Number of boards having the total membership indicated	0		5	2	7	3	14	4	5	1*	3	1	14		59	

* University of Minnesota.

THE EX-OFFICIO MEMBER

A review of the history of the governing boards indicates a gradual decrease in the number of ex-officio or non-voting members. A study of the functions of a board of trustees reveals but little need or occasion for other than the active members.

Twenty-two of the boards of the institutions (Table III) studied have no ex-officio members, while the other organizations comprise from one to four such associates. The governor of the state and the commissioner of education are ex-officio members of the boards in twenty-five and thirty of the institutions respectively.

TABLE III
PERSONS SELECTED AS EX-OFFICIO MEMBERS OF THE GOVERNING
BOARDS OF UNIVERSITIES AND COLLEGES

Person or Title	Number of Institutions
Commissioner of education.....	30
Governor	25
President or chancellor of the institution.....	16
State secretary or commissioner of agriculture.....	11
Attorney-general	3
Chairmen of boards of control.....	1
Lieutenant-governor	1
Speaker of the assembly.....	1
City librarian from place the institution is located.....	1
Eldest lineal descendant of original endower.....	1
Secretary of state.....	1
Chief justice, state supreme court.....	1
President, state senate.....	1
President, state board of education.....	1

METHOD OF SELECTING GOVERNING BOARDS

The two outstanding methods (Table IV) of selecting the boards of trustees of the institutions studied are: (1) appointment by the governor and confirmation by the senate (30 cases), and (2) direct appointment by the governor (11 cases). The former plan seems to be the preferable one, par-

TABLE IV
METHODS OF SELECTING GOVERNING BOARDS IN FIFTY-NINE
UNIVERSITIES AND COLLEGES

Method	Number of Institutions
Appointed by the governor, confirmed by the senate.....	30
Appointed by the governor.....	11
Vote of the people at a general election.....	6
Part of the members chosen by the governor and part by the alumni.....	3
Six of thirty-one appointed by the governor with the approval of the senate, nine elected by the alumni and twelve elected by delegates from the counties	1
Five appointed by state board of education, three by alumni.....	1
Eight appointed by the governor, twenty elected by the board.....	1
Nine by legislature and nine by two institutions under control of the board....	1
Board elects own members, confirmed by the senate.....	1
Chosen by the legislature*	2
Appointed by the governor and council (of the institution).....	1
Five appointed by the governor, fifteen elected by the board, ten elected by alumni, one elected by state group.....	1
Total	59

* University of Minnesota. (Governor appoints when legislature fails to act.)

ticularly if the terms of the members of the board are arranged so that no one governor is in a position to control by appointment a majority of the board. When the governor is required to present appointments to the senate for ratification, acts deserving of public scrutiny are brought into the open.

Appointment at large is no doubt in the long run the best practice. To limit the appointive power by law, and to demand that certain geographical sections or social and economic interests be represented on a board of trustees does not usually bring about the benefits which such a plan is expected to provide. It can, no doubt, be demonstrated that the educational needs of a section of a state or of any specific group of the population are not always best served by the one chosen to do so. To have partisan or special interests represented on an educational board will usually result in a direct loss to the state as a whole. Representation by political subdivisions, as prescribed (Table V) for a number of the institutions studied, can hardly be justified. Twenty-six of the fifty-nine universities and colleges do not limit the appointment of members to the boards of regents or trustees.

TABLE V
VARIOUS GEOGRAPHICAL RESTRICTIONS PLACED ON THE SELECTION
OF MEMBERS TO THE GOVERNING BOARDS OF FIFTY-
NINE UNIVERSITIES AND COLLEGES

Restriction	Number of Institutions
No special geographic distribution.....	26
Distributed as equally as possible among congressional districts.....	9
Distributed as equally as possible among geographic sections.....	6
Distributed as equally as possible among counties or parishes.....	4
No definite information given.....	3
Three from neighborhood of institution and two from other sections of state....	1
Three of nine must be distributed through main geographic divisions of the state, other six are free appointees of the governor.....	1
May not be residents of any city in which principal office of any institution of higher education is located. Otherwise appointed at large.....	1
Four at large, one from each congressional district, three from city in which institution is located, one life trustee and four from alumni.....	1
One half must be divided as equally as possible among counties of state, rest, appointed at large.....	1
Must be from counties in which institutions are located, otherwise appointed at large.....	1
One from each congressional district, two from city in which institution is located and two from chief city.....	1
Reasonable distribution decreed by precedent (not by law).....	1
One for each congressional district (not required by law)*.....	1
One for each congressional district and four from at large. Two must repre- sent each of the following: women, labor, and farmers.....	1
Not more than three from any one county.....	1
Total	59

* University of Minnesota.

TERM OF OFFICE OF MEMBERS

The term of office of members of boards of regents should be long enough to assure continuity in the educational program of the institution. A short term can hardly provide for the best service return, to the state, of the members, and subjects the institution to the continuous fluctuating pressures of the ever changing caprice and demands of a poorly informed public. A term which is too long tends to crystallize traditions and to saddle on the enterprise a complacent social inertia.

Thirty-six of the institutions studied provide terms for the members of the governing boards (Table VI) ranging from six to nine years. Only one of these institutions selects the members of the board for life.

TABLE VI
TERMS OF GOVERNING BOARD MEMBERS OF FIFTY-EIGHT
UNIVERSITIES AND COLLEGES

Terms in years	3	4	5	6	7	8	9	10	Number
								or	of
								More	Institutions
Number of institutions.....	3	11	3	23*	5	4	4	5	58**

* University of Minnesota.

** One institution did not report on this item.

1929 LEGISLATIVE APPROPRIATIONS

The University requested of the 1929 Legislature \$65,000 per year more for the biennium 1929-31 for general maintenance and a building program over the amount allowed for these purposes during the fiscal year 1928-29. These requests involved an increase of \$325,062 for general maintenance and a decrease of \$260,000 for the building program.

The Commission of Administration and Finance recommended \$25,000 less per year for general maintenance for the biennium than the University received during the fiscal year 1928-29, and made no recommendations for a building program. The Senate voted to allow the university requests, and the House allowed less than the University had received previously. The compromise between the House and the Senate gave the University a ten-year \$300,000 per year building program and an increase for general maintenance exclusive of the Hospital, the Grand Rapids School, and special projects of approximately \$50,000. The compromise allowance met an executive veto and the final appropriations granted to the University included the ten-year building program, \$50,000 additional for the Hospital for the care of county indigent patients, and \$30,000 less per year for general maintenance.

nance than was received during the fiscal year 1928-29. The support for general maintenance and for buildings granted by the 1929 Legislature was therefore \$290,000 less for each year of the biennium 1929-31 than was allowed by the 1927 Legislature for these purposes for the year 1928-29 of the 1927-29 biennium.

INTERIM COMMISSION

The two houses of the 1929 Legislature adopted a concurrent resolution calling for the establishment of an Interim Commission to study the government and finances of the University and school aid. The resolution reads as follows:

CONCURRENT RESOLUTION

WHEREAS, It appears desirable that the legislature make a thorough study of the subject of the government, management and control of the University, and of the composition, terms and method of electing or appointing Regents therefor and of the powers and duties of the Regents and of the legislature with respect to the University, existing or proposed or contemplated, and of the experience and method of handling such matters in other states, with a view to making such findings and recommendations and formulating such legislation in relation to these matters as may be deemed necessary or advisable, if any; and

WHEREAS, A thorough study by the legislature of the affairs of the University, of its growth and needs and of its finances and financial condition and operations would tend to promote a better understanding between the University, the legislature and the people of the state and better enable the legislature to deal with these matters; and

WHEREAS, It is deemed advisable that the legislature should make a thorough study of the entire subject of aid to high, graded, semi-graded and rural schools and laws in relation thereto.

THEREFORE BE IT RESOLVED, By the House of Representatives of the State of Minnesota, the Senate concurring, that a committee of ten members be appointed, consisting of five members from the House to be appointed by the Speaker of the House and five members from the Senate to be appointed by the President of the Senate, whose duty it shall be to make a thorough study of the matters herein specified and all matters in relation to the University or in relation to school aid, which it may deem necessary or advisable and report its findings and recommendations to the legislature at the commencement of its session in 1931.

BE IT FURTHER RESOLVED, That said committee be empowered to administer oaths, to subpoena and compel the attendance of witnesses and the giving of testimony and the production of books, records and papers and to take all such evidence as may be available and material relative to the matters hereby committed to its investigation.

BE IT FURTHER RESOLVED, That the members of such committee shall receive their actual expenses necessarily paid and incurred for hotel and

travel in the performance of their duties to be paid out of the legislative expense fund on filing by the members of such committee with the state auditor, of a verified statement showing the amount of such expenses. The state auditor shall audit such claims and issue his warrant upon the state treasury for the amount of such expenses as so audited and the same shall be paid out of the 1929 legislative expense fund. That the total amount of the expense allowed and paid hereunder shall not exceed \$7,000.

Membership of the committee follows :

Senators—

L. P. Johnson	Ivanhoe
Loyd E. Lillygren	St. Paul
Lewis Duemke	Minneapolis
C. Rosenmeier	Little Falls
Will A. Blanchard	Anoka

Representatives—

O. K. Dahle	Spring Grove
Otto W. Kolshorn	Red Wing
W. I. Norton	Minneapolis
R. W. Hitchcock	Hibbing
Mrs. Harriet H. Weeks	Detroit Lakes

INTERCOLLEGIATE ATHLETICS

It is a well-recognized fact that intercollegiate athletics is receiving more consideration at the hands of college faculties now than it has at any time during the preceding decade. This increase of attention arises, not because of a lack of interest on the part of college faculties in intercollegiate sports, nor because they desire to bring about their abandonment, but because of certain dangers and evils that have arisen in connection with them. These dangers and evils were outlined and described in the recent Carnegie report known as *Bulletin* No. 23. It is true that this report was met with derision by certain persons who maintained that it was biased, prejudiced, incomplete, and that it did not present the whole picture. But on the other hand the total picture which the Carnegie report presents of the athletic situation in this country in general is so nearly correct that it cannot be disregarded. The problems which arise in connection with intercollegiate athletics are not student problems, for apparently the students have a sane, if not a saner, attitude with regard to intercollegiate sports than any other group. They are problems which arise because of public interest and the interest of special outside groups in college sports.

The University of Minnesota, believing that the time has come when an intelligent and comprehensive study of the whole program of intercollegiate sports in relation to physical education and in relation to the rest of the University should be considered, appointed a committee this last spring, consisting of Major John L. Griffith, Intercollegiate Conference, Chicago, President H. M. Gage, Coe College, Cedar Rapids, Iowa, Mr. C. W. Savage, Oberlin College, Oberlin, Ohio, Mr. Grantland Rice, New York, to study this matter and to outline and present its findings to the university authorities for their consideration. The report of this committee has been delayed because of the illness of one of its members, but the committee itself has visited the University campus, looked over the physical plant, conferred with the administrative officers of the institution, with members of the university staff, with representatives of the student body, with representative alumni, and with citizens of the community. It has looked into every aspect of the University's program of sports, physical education, and health. It has studied the progress of individual students within the institution both those engaged in athletics and those who are not. It has compared the situation of the University of Minnesota with the situation at other institutions of learning. And while its report is not now in our hands, we look forward confidently in the hope that it will be constructive, far-reaching, indeed perhaps an epoch-making report which will set a standard and outline a preview of this field for maintenance and other educational institutions of this country for years to come.

GIFTS

CASH GIFTS 1928-29

LOAN FUNDS, SCHOLARSHIPS, FELLOWSHIPS, AND PRIZES

\$2,300.23	And \$100 annually (to be added to the principal) from the
100.00	class of 1902 for the establishment of a loan fund for worthy students, preferably those in the junior and senior classes, to be known as the Class of 1902 loan fund.
675.00	From Dr. W. E. Camp for the Dr. W. E. Camp Fellowship in Ophthalmology and Oto-Laryngology.
390.00	From the estate of LaVerne Noyes for the LaVerne Noyes scholarships.
500.00	From the Agricultural Faculty Women's Club for the Agricultural Faculty Women's Club loan fund.

THE PRESIDENT'S REPORT

- \$1,500.00 From the Pillsbury Flour Mills Company for co-operative research in the chemical technology of milling and the utilization of flour mill products to be known as the Pillsbury Flour Mills Company Fellowship.
- 1,000.00 From the Fourth District Minnesota Federation of Women's Clubs for the Dr. Nellie Welch Nelson Home Economics student fund. The principal and interest of the fund are to be available for loans to girls in the Department of Home Economics.
- 100.00 From the Department of Minnesota Woman's Relief Corps, Auxiliary to the Grand Army of the Republic, for the Minnesota Grand Army of the Republic and Woman's Relief Corps Scholarship and loan fund.
- 400.00 From Mr. Earle Brown for the establishment of the Earle Brown loan fund.
- 50.00 Annually from the Young Men's Jewish Club of St. Paul for the establishment of a scholarship for a Jewish student in dentistry to be known as the Arthur V. Aronson Memorial Scholarship fund.
- 40.00 Annually from the Zeta Alpha Psi Forensic Sorority for the establishment of the Zeta Alpha Psi prizes of \$25 and \$15 for an annual extemporaneous speaking contest.
- 100.00 Annually from the Nurses Student Government Association of the University of Minnesota for the establishment of the University of Minnesota Nurses' Student Government Association Scholarship.
- 27.50 From the faculty of the School of Chemistry for the establishment of an annual prize of \$25 in scientific books or journals to the senior who, while registered in the School of Chemistry, has attained the highest scholastic average in the work of the sophomore and junior years and the first two quarters of the senior year, to be known as the Faculty Prize in the School of Chemistry.
- 200.00 From the Minnesota Home Economics Association for the establishment of a scholarship for the year 1929-30 for freshman girls in the Division of Home Economics to be known as the Minnesota Home Economics Association Freshman Scholarship.
- 1,050.00 From Mrs. Helen R. Dwan for the establishment of the Helen Dwan fund with the understanding that the income from the fund will be used as a prize to be awarded each year to a student in the Department of Music, junior or senior, and with the further understanding that the principal and income, each or both, may be used as a loan fund in the Department of Music.
- 50.00 Annually from the Beta Iota Alpha Sorority for the establishment of the Beta Iota Alpha Scholarship.

- \$ 100.00 Staring Realtor Scholarship.
 2,000.00 From the estate of Lillian Lawhead Rinderer for the establishment of a loan fund to be known as the William Arthur Lawhead Scholarship fund.
 500.00 From Lambda Alpha Psi for Lambda Alpha Psi graduate loan fund.

Additions to Previous Gifts

- 920.00 From Biscuit and Cracker Manufacturers' Association for the Streitmann Fellowship.
 1,500.00 From the Northern Lumber Company and the Cloquet Lumber Company (\$750 each) for the continuance of the Cloquet Wood Fibre Fellowship.
 650.00 From anonymous donors for the Law Faculty Scholarship fund.
 150.00 From the Law Alumni Association for the Law Alumni Association Scholarship.
 150.00 From the *Minnesota Law Review* for the Minnesota Law Review Scholarship.
 200.00 From the Merchants National Bank of St. Paul for the Merchants National Bank of St. Paul student loan fund (now First National Bank of St. Paul student loan fund).
 50.00 Annually from the Alumnae Association of the School of Nursing for the Louise M. Powell prize.
 97.19 From the Dads for the Dad's Day loan fund.
 30.00 From the *Minnesota Quarterly* for the Minnesota Quarterly Prize.
 2,822.01 Miller Teaching Fellowship.
 1,350.00 Niagara Sprayer Company Fellowship.
 1,750.00 American Dry Milk Institute Fellowship.
 156.00 Coffman Educational Research Foundation.
 250.00 Class of 1890 Fellowship.
 175.00 Pillsbury Debate Prize.
 100.00 Peavey Prize fund.
 30.00 Magney and Tusler Prize in Architecture.
 105.00 Minnesota State Pharmaceutical Association Scholarship.
 750.00 St. Paul College Women's Club scholarships.
 150.00 Faculty Women's Club, Students' Section, scholarship fund.
 100.00 P. E. O. Scholarship.
 500.00 George H. Partridge Scholarship fund.
 100.00 Mrs. Elbert R. Carpenter Scholarship fund.
 100.00 Mrs. George C. Christian Scholarship fund.
 100.00 Mrs. George P. Douglas Scholarship fund.
 100.00 Agricultural Faculty Women's Club Scholarship.
 50.00 Delta Sigma Psi Scholarship.
 750.00 duPont Fellowship.
 100.00 American Legion Auxiliary Scholarship fund.
 15.00 Phi Lambda Upsilon Prize fund.

\$ 10.00	Alpha Chi Sigma Twin City Alumni Association Prize in Chemistry fund.
50.00	Home Economics Association Scholarship fund.
40.00	American Society of Civil Engineers, Northwest Section, Prize fund.
15.00	Alpha Alpha Gamma Prize in Architecture fund.
500.00	Pullman Company Scholarship.
75.00	American Institute of Architects, Minnesota Chapter, Prize fund.
50.00	Phi Upsilon Omicron Scholarship fund.
50.00	School of Architecture Faculty Prize fund.
25.00	William A. French Interior Decoration Prize fund.
200.00	Linner Prizes in Swedish.
250.00	From an anonymous donor for the Law Alumni loan fund.
500.00	From Mrs. Florence Brewster for the Henry Webb Brewster Scholarship (1928-29, 1929-30).
250.00	From Mrs. Florence Brewster for the Florence A. Brewster scholarships of \$125.00 each (1929-30).
100.00	From Minnesota Society of Internal Medicine for the Charles Lyman Greene Prize in Physiology (1929-30).

RESEARCH AND EXPERIMENTS

\$3,000.00	From the Institute of American Meat Packers for research on the study of rancidity in animal fats (Division of Agricultural Biochemistry).
500.00	From the American Society of Mechanical Engineers and the Engineering Foundation for research on fluid flow.
800.00	From the Hoffman-LaRoche Chemical Works for investigation of the question of the rate of excretion of substances of the barbital series of soporic drugs.
302.00	From the Ohio Chemical and Manufacturing Company for the publication of colored plates for a bulletin on ethylene gas treatment.
1,000.00	From the National Lumber Manufacturers Association for carrying out a co-operative experiment in the transmission of heat through lumber.
250.00	From an anonymous donor to be used in conducting a study in the commercial development of the upper Mississippi River.
375.00	From Bates Valve Bag Corporation of Chicago for the conduct of an investigation by the Division of Biochemistry to determine the value of certain types of bags in protecting various products from infestation by insects.
1,000.00	From the Hugh L. Cooper & Company, Inc., New York City, to cover an investigation of concrete in which a certain amount of clay is used, this investigation to be carried on by the College of Engineering and Architecture.

- \$ 550.00 From the Victor Chemical Works, Chicago, for an investigation of methods of preventing cereal smuts by dusting with chemicals, with special reference to copper oxalate.
- 300.00 From the American Council on Education for an experiment in the measurement of temperament to be conducted under the direction of Professor D. G. Paterson (Psychology).
- 15,000.00 From Mrs. George C. Christian and Messrs. F. C. Atkinson, James F. Bell, Joseph Chapman, F. M. Crosby, E. W. Decker, E. C. Gale, F. T. Heffelfinger, F. E. Murphy, A. F. Pillsbury, F. B. Snyder, John R. Van Derlip, and Carl Jones, for the establishment of the Jenks Research Fund for Anthropological Exploration for the current year. \$9,500 per year has been pledged for a five-year period.
- 3,000.00 Per year for a period of three years from the Sporting Arms and Ammunition Manufacturers' Institute for an investigation into the life history and ecology of ruffed grouse.
- 3,000.00 Per year for a period of five years from the Rockefeller Foundation to be used for the establishment of a laboratory for rock analysis.

Additions to Previous Gifts

- 270.00 From the Institute of American Meat Packers for the purpose of assisting in, and carrying out, a study on methods of cooking pork products.
- 1,750.00 From the American Society of Heating and Ventilating Engineers.
- 1,000.00 From Eli Lilly and Company for continuance of work on investigation of the physiological effects of ethylene on organisms and on enzyme action.
- 1,400.00 Minnesota Valley Canning Company research fund.
- 3,192.50 Minnesota Committee on the Relation of Electricity to Agriculture research fund.
- 2,000.00 Flaxseed development fund.
- 725.00 Minnesota Cannery Association research fund.
- 2,485.54 Fox Breeders' Distemper research fund
- \$619.03 Fromm Bros., Nieman & Company
 - 969.51 New York Auction Company
 - 126.00 American Hide and Fur Company
 - 21.00 Sale of pelts
 - 150.00 Hercules Fur Farms
 - 500.00 Lincoln Fox Farms, Inc.
 - 100.00 Minnesota Silver Fox and Fur Company.
- 37.66 From *Minneapolis Tribune* for research in School of Business Administration.
- 100.00 From the American Social Hygiene Association to supplement the budget of the Social Hygiene Bureau for work in sex education.

MISCELLANEOUS

\$1,000.00	From the International Education Board for expenses of Dr. Karl Friederichs of the University of Rostock, Rostock, Germany, to visit entomological centers in United States and to lecture at the University of Minnesota.
400.00	From the Public Education Association, New York City, for the purpose of paying part of a salary of an instructor in the field of visiting teachers.
50,000.00	From the Laura Spelman Rockefeller Memorial for the purchase of stock in Parents' Publishing Association, Inc.
1,500.00	From the Carnegie Foundation for the Advancement of Teaching to be expended for library purposes for the College of Dentistry.

SUMMARY

Loan funds miscellaneous		
New (6)	\$ 6,800.23	
Additions to old (3)	547.19	
	<hr/>	\$ 7,347.42
Scholarships		
New (7)	990.00	
Additions to old (20)	4,611.00	
	<hr/>	5,601.00
Fellowships, miscellaneous		
New (2)	2,175.00	
Additions to old (7)	9,342.01	
	<hr/>	11,517.01
Prizes		
New (3)	1,117.50	
Additions to old (14)	915.00	
	<hr/>	2,032.50
Research and experiment		
New (13)	47,077.00	
Additions to old (10)	12,960.70	
	<hr/>	60,037.70
Miscellaneous (4)		52,900.00
		<hr/>
Grand total		\$139,435.63

CASH GIFTS 1929-30

LOAN FUNDS, SCHOLARSHIPS, FELLOWSHIPS, AND PRIZES

\$ 300.00	From the Ramsey County Medical Auxiliary for two loan funds of \$150 each available for medical students at the University.
1,000.00	E. R. Squibb and Sons for a fellowship in the Department of Pharmacology for the study of the properties of neoarsphenamine.

- \$ 25.00 Annually beginning 1929-30 from the Minnesota Chapter of Tau Beta Pi for a prize to be known as the Tau Beta Pi Prize (College of Engineering and Architecture, School of Chemistry, School of Mines and Metallurgy) to be awarded to a regular freshman in the College of Engineering and Architecture, the School of Chemistry, or the School of Mines and Metallurgy, on the basis of high scholarship in the fall and winter quarters of his first year.
- 700.00 From the Minneapolis Auxiliary of the Delta Sigma Delta Fraternity for the establishment of a student loan fund (preference to be given to needy and eligible dental students who are members of the Delta Sigma Delta Fraternity) to be known as the Delta Sigma Delta loan fund.
- 50.00 From the Mother's and Wife's Club of the Sigma Alpha Mu Fraternity for the establishment of a loan fund to be known as the Sigma Alpha Mu Scholarship fund.
- 250.00 For the establishment of two scholarships for the Department of Music of \$125 each for the year 1930-31.
- 500.00 From the Alpha Alumnae Chapter of Phi Upsilon Omicron for the establishment of a fund to be known as the Mary L. Bull Scholarship fund, the interest of which is to be awarded to needy and worthy students enrolled in the courses in Home Economics.
- 100.00 Annually beginning 1930-31 from the Delta Phi Epsilon Sorority for a scholarship to a girl chosen by the dean of women and a committee of girls from the Delta Phi Epsilon Sorority.
- 75.00 From Lambda Alpha Psi Society for two prizes of \$50 and \$25 for independent work in languages and literature among the undergraduates.
- 235.37 From the Class of 1929 for the general student loan fund.

Additions to Previous Gifts

- 1,191.67 From the Mrs. Ueland Memorial Fund Committee for the Clara Ueland Fellowship.
- 750.00 From the E. I. duPont de Nemours and Company for the continuation of the E. I. duPont de Nemours and Company Fellowship in Chemistry.
- 200.00 From the First National Bank of Saint Paul for the First National Bank of Saint Paul student loan fund.
- 1,500.00 From the Cloquet Lumber Company for the continuance of the Cloquet Wood Fibre Fellowship.
- 3,000.00 From the Institute of American Meat Packers for the continuance of the Institute of American Meat Packers Fellowship in the Department of Biochemistry.
- 1,400.00 From the Fourth District of the Minnesota Federation of Women's Clubs for the Dr. Nellie Welch Nelson Home Economics student fund.

THE PRESIDENT'S REPORT

\$ 100.00	From the Woman's Relief Corps of the Grand Army of the Republic for the Minnesota Grand Army of the Republic and Woman's Relief Corps Scholarship and loan fund.
1,050.00	From Mrs. Helen R. Dwan for the Helen Dwan fund \$1,000.00—Loan Fund 50.00—Prize.
200.00	From the Minnesota Home Economics Association for the Minnesota Home Economics Association Freshman Scholarship for 1930-31.
974.88	From Dr. W. E. Camp for the Dr. W. E. Camp Fellowship in Ophthalmology and Oto-Laryngology.
800.00	Fleischmann Fellowship \$400—Standard Brand, Inc. 400—Fleischmann Company.
2,141.57	Miller Teaching Fellowship.
750.00	Pillsbury Flour Mills Company Fellowship.
2,000.00	Pokegama Tuberculosis Fellowship.
200.00	Advertising Club of Minneapolis Scholarship (1928-29 and 1929-30).
15.00	Alpha Alpha Gamma Prize in Architecture fund.
10.00	Alpha Chi Sigma Twin City Alumni Association Prize in Chemistry.
75.00	American Institute of Architects, Minnesota Chapter, Prize fund.
40.00	American Society of Civil Engineers, Northwest Section, Prize
250.00	Florence A. Brewster scholarships (1930-31).
250.00	Henry Webb Brewster Scholarship (1930-31).
25.00	From Benjamin A. Paust for the Delta Sigma Psi Scholarship for 1929-30.
100.00	Mrs. Elbert R. Carpenter Scholarship.
25.00	School of Chemistry Faculty Prize.
100.00	Mrs. Geo. C. Christian Scholarship.
250.00	Class of 1890 Fellowship.
600.00	St. Paul College Women's Club scholarships.
100.00	Mrs. George P. Douglas Scholarship fund.
150.00	Faculty Women's Club, Students' Section, Scholarship fund.
25.00	William A. French Interior Decoration Prize fund.
50.00	Home Economics Association Scholarship fund.
30.00	Magney and Tusler Prize in Architecture.
150.00	Minnesota Law Review Scholarship.
30.00	Minnesota Quarterly Prize.
105.00	Minnesota State Pharmaceutical Association.
100.00	Nurses' Student Government Association Scholarship.
100.00	P. E. O. Scholarship.
500.00	George H. Partridge Scholarship fund.
100.00	Peavey Prize fund.
15.00	Phi Lambda Epsilon Prize.

\$ 50.00	Phi Upsilon Omicron Scholarship.
175.00	Pillsbury Debate Prize fund.
50.00	Louise M. Powell Prize.
250.00	Pullman Company Scholarship.
50.00	School of Architecture Faculty Prize.
40.00	Zeta Alpha Psi Prize.
232.00	Coffman Educational Research Foundation.
25.00	Pi Beta Chapter of Chi Omega Prize fund.
200.00	Agricultural Faculty Women's Club Scholarship fund.
2,550.00	American Dry Milk Fellowship.
2,575.00	Law Alumni Scholarship.
900.00	Law Faculty Scholarship.
100.00	Phi Beta Chapter of Mu Phi Epsilon Scholarship.

\$ 29,290.45

RESEARCH AND EXPERIMENTS

\$ 1,600.00	From the National Cannery Association, Washington, D.C., for the Division of Home Economics for the purpose of testing a set of recipes for the use of canned foods in institutional size amounts.
1,325.00	From the Minnesota District of the American Association of Hospital Social Workers for a fund for the assistance of graduate students of medical social work to be known as the Medical School work fund.
600.00	From George A. Hormel and Company for use in the Department of Bacteriology in the study of antiseptics by Dr. H. O. Halvorson.
412.50	From various members of the staff and others for the establishment of the Harris Memorial Research fund to be used for the aid or furtherance of research in fields in which Dr. Harris was interested.
1,000.00	From Oliver Iron Mining Company to be used in connection with the study of geological concentration of iron ore for the Department of Geology.
1,133.97	From the National Research Council to aid Dr. George O. Burr in his researches on the physiological effects of radiation.
1,000.00	From the National Research Council to aid Professor A. T. Rasmussen for the promotion of his studies on the human hypophysis.
1,000.00	From the National Research Council to be used in connection with the study of the rôle of the fatty acids in the vital organs and blood stream, by Professor George O. Burr, Department of Botany.
300.00	From the National Research Council to be used in connection with the study of the value of selected samples of rocks as representative of the composition of masses of igneous rocks, by Professor Frank F. Grout, Department of Geology.

THE PRESIDENT'S REPORT

- \$ 900.00 From George A. Hormel and Company for the conduct of an investigation to determine the nutritive and biochemical changes occurring in meat when preserved by the Taylor quick-freezing process.

* *Additions to Previous Gifts*

- \$ 5,693.75 Fox Breeders' Distemper Research fund
 \$1,412.50 Lincoln Fox Farms Inc., Bangor, Maine
 2,781.25 Central New York Fur Co., Inc.
 700.00 Hercules Fur Farms
 300.00 Dr. J. A. Allen
 500.00 American National Fox and Fur Breeders Ass'n
 75.00 Springdale Silver Fox Farms.
- 317.93 From the Eli Lilly and Company for the Eli Lilly and Company research fund in Pharmacology.
- 1,000.00 From the Hoffman-LaRoche, Inc., for the Hoffman-LaRoche Chemical Works research fund.
- 2,600.00 From the Flaxseed Development Committee for flaxseed development fund.
 975.00 Minnesota Cannery Association research fund.
- 2,800.00 Minnesota Valley Canning Company research fund.
- 270.00 Institute of American Meat Packers (Home Economics).
- 1,750.00 American Society of Heating and Ventilating Engineers for co-operative research.

\$ 21,788.15

MISCELLANEOUS

- \$ 50.00 From the Phi Delta Phi Fraternity for the purchase of ornamental receptacles for the Law School.
- 500.00 From Annie Carpenter toward the purchase of special photographic equipment for the Department of Ophthalmology and Oto-Laryngology.
- 1,156.00 From Frederick J. Wulling for the establishment of a trust fund to be known as the Frederick J. Wulling trust fund, the income of which is to be expended for books, portraits, prints, museum items, and the like, of historical interest to pharmacy, for the Pharmaceutical Department Library.
- 25,000.00 From the Spelman fund for the purchase of stock in Parents' Publishing Association, Inc. (additional gift).
- 400.00 From the Public Education Association, New York City, for the purpose of paying part of a salary of an instructor in the field of visiting teachers.
- 30,500.00 From the following for the establishment of the Thomas S. Roberts fund for the publication of Dr. Roberts' book, *Birds of Minnesota*:

E. F. Allen.....	\$ 1,000	Lucia Peavy	}\$1,000
James F. Bell.....	10,000	Heffelfinger	
Kate Koon Bovey } Charles C. Bovey }	..... 2,000	Frank T. Heffelfinger	
Carolyn McKnight Christian .....	..... 5,000	A. C. Loring.....	1,000
Marie Andrews Commons	} ... 1,000	Frank M. Prince.....	1,000
Frank W. Commons		Louise Koon Velie...	2,000
Howard W. Commons		Frederick B. Wells...	1,000
Harriet McKnight Crosby	} ... 3,000	Georgia Andrus Brooks	} 1,000
Franklin M. Crosby		Anton S. Brooks	
			Margaret Hastings Crosby	} .. 1,000
		John Crosby	
		Sarah Pillsbury Gale	} .. 500
		Edward C. Gale	
\$ 25,000.00	From the late Herschel V. Jones to be known as the Herschel V. Jones journalism fund, and to be used for the purchase of newspaper files of historical or some other permanent value and books of reference relating to journalism, the history of printing, and kindred subjects.		
800.00	From Dean and Mrs. E. P. Lyon for the National Research Fellowship candidate for 1930-31.		
230,392.27	From the Wm. Henry Eustis estate for the Minnesota Hospital and Home for Crippled Children fund.		
52,486.00	Cash.		
87,100.00	Bonds, from the Greater University Corporation fund to be used in aiding further construction and equipment of the Cyrus Northrop Memorial Auditorium.		
	From Edward A. Everett of Waseca, Minnesota, certain interests (based upon the failure of the Waseca Public High School to accept a collection of birds, mammals, fishes, and other specimens and objects of natural history) and whatever residue is left from the estate after paying of life income to certain beneficiaries, to provide means of furthering educational work in the general field of ornithology.		
	From William M. Atkinson certain interests in the residue and remainder of the estate left to Grace M. Atkinson subject to a period of five years after which time the interest is vested absolutely in Grace M. Atkinson for the purpose of building and maintaining a hospital or a wing to a hospital, not to exceed \$225,000 on the campus of the University of Minnesota as the Board of Regents may deem best, to be designated "The Helen Jane Atkinson Memorial Hospital" for the care of sick, in-		

valid, or ailing children under fifteen years of age whose parents or guardians are unable to bear the expense of medical and hospital care; the balance of the fund to be applied toward the maintenance of such building.

\$ 600.00 Partial payment by the executor, under the provisions of the will of Thomas F. Andrews bequeathing certain interests in his estate, the principal of which is to be safely invested and the income used to aid in the field of research in geology under the supervision of the Department of Geology of the University of Minnesota, and a certain proportionate share in the following investments:

334 shares Roan Antelope Copper Mines, Ltd.
400 shares Consolidated Africal Selection Trust, Ltd.
1,050 Rhodesian Selection Trust, Ltd.
3,120 shares Trepca Mine Company.

SUMMARY

Loan funds miscellaneous		
New (4)	\$ 1,285.37	
Additions to old (4)	2,700.00	
	<hr/>	\$ 3,985.37
Scholarships		
New (3)	\$ 850.00	
Additions to old (21)	6,950.00	
	<hr/>	7,800.00
Fellowships, miscellaneous		
New (1)	\$ 1,000.00	
Additions to old (12)	16,140.12	
	<hr/>	17,140.12
Prizes		
New (2)	\$ 100.00	
Additions to old (17)	860.00	
	<hr/>	960.00
Research and experiment		
New (10)	\$ 7,971.47	
Additions to old (8)	16,781.68	
	<hr/>	24,753.15
Miscellaneous (11)		453,985.17
		<hr/>
Grand total		\$508,623.81

OTHER GIFTS 1928-29

BOOKS

14,714 gifts from 2,347 donors.

\$50 from the District Grand Lodge No. 6, Independent Order B'nai B'rith for the purchase of books on Jewish reference subjects for the University Library.

25 law books from Mrs. H. D. Ecton for the law library.

MISCELLANEOUS

A cathode ray tube from the Westinghouse Lamp Company, Bloomfield, New Jersey, for the School of Chemistry.

Letters and pictures belonging to the late William Henry Eustis from Gardner T. and John Eustis.

A document from the Rev. W. H. Thomas bearing the autographs of ex-President Northrop, ex-President Folwell, Miss Sanford, ex-Governor Pillsbury, and a number of other people noted in university and Minneapolis circles.

Two power-driven vacuum pumps from the Western Electric Company, for the College of Engineering and Architecture.

One hundred six volumes of Whipple's *Catalogue Studies* and bookcase from the Whipple's Technical Libraries, Boston, Massachusetts for the Department of Mechanical Engineering.

Seven autographed Victor records, twelve compositions, together with an autographed photograph, from Professor Thurlow Lieurance for the Department of Music.

Annual gift of a cup from Kappa Rho, forensic sorority, to the senior woman of outstanding distinction in one or more of the speech arts.

A neon-electric stroboscope from the General Electric Company for the Department of Electrical Engineering.

Large frame photograph of the United States Supreme Court, autographed, from the Honorable Pierce Butler.

OTHER GIFTS 1929-30

BOOKS

12,424 gifts from 2,745 donors for the library.

A copy of the *Codex Argenteus Upsaliensis* from the Royal University of Uppsala, Sweden, for the library.

162 volumes from Robert Davis Longyear for the School of Mines and Metallurgy.

The late Dr. W. R. Murray's collection of eye, ear, nose, and throat books from Mrs. Murray for the Department of Ophthalmology and Otolaryngology.

\$50 from the District Grand Lodge No. 6, Independent Order B'nai B'rith for the purchase of books on Jewish reference subjects for the University Library.

An annual prize consisting of *Mechanical Engineers' Handbook* from the Minnesota Gamma Chapter of Pi Tau Sigma Fraternity to the sophomore in Mechanical Engineering who obtain the highest scholastic grades during his freshman year.

MISCELLANEOUS

An illuminated bulletin board from the class of 1929.

Nine large paintings and two plaster panels of American historic scenes for the library of the West Central School and Station, Morris, from the classes of 1925-26, 1927-28, and 1929 of the school.

A majestic radio from Foster and Waldo, Inc., for the Music Department.

An old motor made by Roth Brothers and Company from H. A. Rogers Company for the Department of Electrical Engineering Museum.

Two pictures from Mrs. Simon Kruse for the Students' Health Service.

A set of Unit heaters from the Arctic Nu-Air Corporation for the Department of Mechanical Engineering.

A number of pieces of electrical apparatus from the Western Electric Company for the Department of Electrical Engineering.

The following gifts for the College of Engineering and Architecture:

Hoffman Thermador electric heater from the Hoffman Specialty Company of Waterbury, Connecticut.

Squirrel cage motor from the Louis Allis Company, Milwaukee, Wisconsin.

Ball-bearing motor from the Ohio Electrical and Controller Company, Cleveland, Ohio.

Two repeater coils, two transformers, and two filters from the Northwestern Bell Telephone Company of Minneapolis.

Special type of endless leather belt from Alexander Brothers, Incorporated, Philadelphia, Pa.

Gear speed reducer from the W. A. Jones Foundry and Machine Company, Chicago, Illinois.

Exhibit of sanitary equipment from the Crane Company of Minneapolis.

Two filters and four transformers from the Northwestern Bell Telephone Company of Minneapolis.

An exhibit of bolting cloth production for the Division of Agricultural Biochemistry from Hammond and Homberger Company.

Gold medal and scroll from the Southern Minnesota Medical Association for a senior in the Medical School.

Use of a Hollerith tabulating machine from the International Business Machine Company for the School of Business Administration and other departments.

A portrait of President L. D. Coffman for the Coffman Educational Research Foundation.

**ADMINISTRATIVE ACTIONS OF GENERAL
INTEREST**

ADMINISTRATIVE ACTIONS DURING THE BIENNIUM 1928-30 OF GENERAL IMPORTANCE

The following administrative actions are of special importance during this biennium:

1. On November 10, 1928, the Board of Regents voted to approve the plan for the development of "University Grove" for faculty home-site purposes, to approve form of lease, and to authorize the making of improvements on the tract from funds already set aside for these purposes.

2. On November 15, 1929, the Board of Regents voted unanimously to approve the plan for the insurance of members of the staff and employees against death and disability.

3. On November 15, 1929, the Board of Regents accepted the provisions of Chapter 191 of the *Minnesota 1929 Laws*, which provided for a state employees retirement fund. In accepting the provisions of the act the regents directed that all new non-faculty members, unless exempted by the board, would be required to comply with the terms of the act and accept membership, but gave all present non-faculty employees the option of accepting or not membership in the fund. The plan provides that each employee shall pay into the fund $3\frac{1}{2}$ per cent of his annual compensation and after a certain period of service, or upon becoming totally disabled, the employee may retire on one half of his annual compensation but not to exceed \$1,800 per year.

4. On July 18, 1929, the Board of Regents received from the Greater University Corporation, which corporation was organized for the solicitation and collection of funds for the construction of the Stadium and of the Cyrus Northrop Memorial Auditorium, all of the assets of that corporation. The assets as of that date included \$52,486.90 cash, \$87,100.00 in bonds, pledges receivable from the public, alumni, faculty, employees, and students, and certain office furniture and equipment and other minor holdings. All of these funds had been previously pledged for the construction of the Auditorium and any collection of outstanding pledges made by the regents are to be devoted to a further completion of the Auditorium.

5. On November 4, 1929, the attorney-general of Minnesota ruled that the Board of Regents might insure its buildings against

fire provided the premiums for the insurance were paid from funds other than those appropriated by the legislature. The attorney-general did not pass upon the question of whether the legislature may prohibit the use of appropriated funds for the payment of insurance premiums. He based his opinion upon the decision made by the Supreme Court in the case of *State ex rel. University of Minnesota vs. Chase*, 175 Minn. 259, which held that Article VIII, section 4, of the constitution vested certain powers in the regents which include "Management of the University."

The attorney-general held, however, on the same date that the Board of Regents was without authority to purchase insurance against public liability for the reason that the University is an agency or department of the state government and is not liable in damages for injury to person or property caused by the operation of the automobiles owned by it.

On receipt of these opinions the regents referred to the Buildings and Grounds Committee for investigation and report the study of university buildings with a view to insuring them against fire and tornado. Insurance has already been placed on the Minnesota Union and plans are under way to insure certain other buildings which are revenue producing.

6. A significant step in the improvement of fraternity scholarship is seen in the following action of the Academic Interfraternity Council:

The Academic Interfraternity Council requires that all pledges, to be eligible for initiation, must have made a grade average, for one quarter after pledging and preceding initiation, equal to that average necessary for graduation in the college to which the pledge member belongs. If the pledge does not make such an average in one of the first three quarters after pledging, he must be dropped from the fraternity. Fraternities must have proposed initiates passed on for grade requirements by the President of the Interfraternity Council one week before initiation.

7. A forward step was taken on February 10, 1930, when the Board of Regents entered into an agreement with the Board of Education of the city of Minneapolis providing for certain cooperative educational procedures of mutual interest to the University and the public schools. This agreement is incorporated in Dean Haggerty's report.

8. On June 27, 1930, the Buildings and Grounds Committee

of the Board of Regents voted to recommend authorization for the calling for bids for the first unit of the men's dormitory, estimated cost of \$315,000, with the understanding that the funds for this purpose are to be derived from the dormitory fund and advanced from service enterprises and revolving fund.

9. On April 5, 1928, the Board of Regents voted to establish a Division of Library Instruction offering regular courses for training in library work. The university librarian is made director of the Division of Library Instruction, and the faculty of the division, to be approved by the Board of Regents, is to be recommended by him.

10. In April, 1927, the Board of Regents authorized the construction of a Field House to cost approximately \$650,000 and to be financed by the use of the \$200,000 balance in the Athletic Fund and the proceeds from an issue of \$450,000 of Field House bonds. The bonds were sold and the proceeds and the balance were used for the construction of the Field House which was completed and ready for occupancy in the winter of 1927-28.

The trust agreement covering the issue of the Field House bonds provided for the retirement of these bonds over a fifteen-year period beginning August 1, 1928, and ending August 1, 1943, but included a provision that the bonds, should funds be available in athletic receipts, might be retired in reverse order of maturity as rapidly as circumstances permitted. The last Field House bonds were called for redemption and retired on February 1, 1930, thirteen years ahead of the scheduled retirement and only two and one-half years after issue. There exist now no outstanding obligations against any university buildings, athletic or otherwise.

11. On December 21, 1929, the Board of Regents voted to approve recommendations that the B.S. degree in medical science for candidates for the M.B. degree, and the B.S. degree in medical technology for candidates in the technicians' course, be administered by the Medical School.

12. On April 25, 1930, the Board of Regents voted to authorize granting of the Phm.C. degree to those students who will have completed at the close of the spring quarter of 1932 the requirements for the three-year course in pharmacy.

13. On April 25, 1930, the Board of Regents voted to authorize acceptance of full commutation instead of uniforms for basic

students in military training and to authorize the purchase of a uniform to cost not to exceed \$25 to be financed as a revolving fund from the government commutation and the military student's deposit.

14. On July 18, 1929, the Board of Regents voted to authorize a new position of field auditor in the office of the comptroller for the purpose of auditing and examining offices of the University receiving funds or disbursing funds from contingent funds and for the further purpose of instructing all offices in university business methods.

15. On April 25-26, 1930, the Board of Regents voted to change the name of the Department of Farm Management and Agricultural Economics to the Department of Agricultural Economics.

16. Beginning with year 1927-28 the University established fifty freshman scholarships, amounting to \$100 each, but later changed to the amount of tuition fees in college in which student is registered. These scholarships were to be given to the fifty picked students of high intellectual ability with the thought that recognition of this sort would stimulate scholarship. The scholarships were discontinued beginning with the year 1929-30 for the reason that the experience which we had with them demonstrated clearly that we were not securing the results anticipated.

FEES

Many changes in fees occurred during the period under review. Some new fees were established. Both the list of changes and the new fees appear herewith:

Voted to approve a special fee of one dollar per credit hour for music education courses in class instrument teaching with the understanding that the specific courses to which this fee is to be applied will be approved in the bulletin copy by the president of the University.

Voted to approve a laboratory fee for handicraft courses in art education requiring materials supplied by the department with the understanding that the specific courses to which this fee is to be applied will be approved in the bulletin copy by the president of the University.

Voted to amend the minutes of May 9, 1928, relative to *Minne-*

sota Techno-Log fee to provide that any student, who withdraws before the end of two weeks after the opening of the quarter, be refunded the forty-cent fee and that any student who does not withdraw prior to this time must pay the full fee. It was further understood that a charge of 5 per cent of the amount so collected for the *Minnesota Techno-Log* be made by the University for collection services rendered.

Voted to authorize a laboratory fee of \$1 to be charged to all students enrolled in Journalism with the exception of Journalism 5, The American Newspaper.

Voted to approve, effective beginning with the academic year 1929-30, a fee of \$40 plus the established \$10 graduation fee for the degrees of master of science in engineering *in absentia* and civil engineering, mechanical engineering, and electrical engineering *in absentia*.

Voted to approve, effective beginning with the summer 1930, a fee of \$25 for the Civil Engineering Summer Surveying Camp.

Voted to authorize the Summer Session through the Department of Agricultural Education to offer a course during the summer quarter of 4½ credits at a fee of \$15.

Voted to authorize charging a fee of \$10 for students in Forestry at Itasca Park.

Voted to authorize an increase from \$3 to \$4 per year in the charge for service of the Bureau of Recommendations in the College of Education.

Voted to approve for the year 1929 the following courses not listed in the summer session bulletin with the understanding that a special fee of \$44.50 will be collected from each student registered in these courses: Civil Engineering 135; Civil Engineering 141; Civil Engineering 142.

Voted to authorize removal of *Techno-Log* fee of fifty cents from of School of Mines and Metallurgy students effective the fall quarter 1929-30 with the understanding that this action does not authorize establishment of a new paper by the School of Mines and Metallurgy students.

Voted to ratify the following existing fees for inclusion in the *Laws and Regulations of the University*:

The general deposit fee of \$5 for all students except those registered in Medicine, Dentistry, and Pharmacy. (For these groups the general deposit fee of \$10 was authorized June 17, 1920.)

The fee of \$1 for each examination for the removal of a condition.

The fee of \$5 for each special examination.

A preliminary deposit of \$10 for reserving a place for entering students of the freshman classes of the Medical School and the College of Dentistry, to be credited on the first quarter's fees, but not to be refundable in case the student fails to attend, unless due notice is given.

A charge of ten cents against the general deposit for the issuance of a duplicate fee receipt.

Voted to ratify the following fees:

School of Nursing	Resident	\$25 per quarter
	Non-resident	25 per quarter
Medical Technicians	Resident	30 per quarter
	Non-resident	40 per quarter

Voted to approve rescinding action of May 17, 1922, so far as it provides a 10 per cent reduction in the total fee for the students registering for three or more courses in the General Extension Division.

Voted to approve recommendation that, out of the \$10 diploma fee paid by each outgoing senior, \$2.50 be appropriated to cover the cost of the first year's subscription to the *Alumni Weekly*.

Voted to approve the following regulation regarding health fees for graduate students:

All students who are registered for five credits or more in any quarter shall be required to pay the regular incidental fee; while students who are registered for less than five credits in any quarter shall not be charged any incidental fee, nor be permitted to pay this fee in order to obtain the privileges to which the payment of this fee entitles students.

Voted to approve the following regulation regarding missed appointments for periodic health examinations:

A student, who is given an appointment for a periodic health examination at the Students' Health Service and fails to keep his appointment without notice to the Health Service at least forty-eight hours in advance of the time of the appointment, shall be given a new appointment for a health examination within that academic year only upon the payment of the cost of this examination. Exceptions to this ruling may be made by the Dean of Student Affairs at his discretion.

Voted to authorize reduction in the summer session fee in the College of Dentistry from \$80 for the entire session, or \$40 for each term, to \$60 and \$30 respectively.

Voted to approve, effective beginning with fiscal year 1930-31, a laboratory fee of \$2 per quarter in the School of Chemistry in

the first and second year courses in inorganic chemistry, qualitative analysis, and quantitative analysis.

Voted to approve, effective beginning with the fiscal year 1930-31, a laboratory fee of \$1 per quarter in the College of Science, Literature, and the Arts, for Psychology 4 and 5 and \$2 per quarter for Psychology 7.

Voted to approve gymnasium fee increase at the Northwest School and Station, Crookston, Minnesota and the West Central School and Station, Morris, Minnesota from \$.25 to \$1 per term effective beginning with the school year 1930-31.

THE GOVERNMENT OF THE UNIVERSITY

SUPREME COURT DECISION

Below is printed the syllabus of the decision of the Minnesota Supreme Court in the case of *State of Minnesota on Relation of University of Minnesota and the Board of Regents of the University, Petitioners and Respondents versus Ray P. Chase, State Auditor, Defendant and Appellant*:

1. L. 1925, c. 426, the Act "in relation to the organization of the state government," construed to include the state university as one of the agencies of state government intended to be subjected to the control of the Governor through the Commission of Administration and Finance. That the university is a body corporate with a large degree of independence does not prevent its being considered, from the standpoint of functions and purposes, an instrument or agency of the state to accomplish the governmental end of higher education.

2. The Board of Regents was incorporated by the territorial assembly (L. 1851, c. 3) with the right to "govern" the university. By the state constitution (Sec. 4, art. 8) all the "rights, immunities, franchises and endowments" so granted were "perpetuated unto" the university. Accordingly, the Board of Regents, in the management of the university, is constitutionally independent of all other executive authority; and in so far as L. 1925, c. 426, attempts to subject the control of university finances to the supervision of the Commission of Administration and Finance it is unconstitutional.

3. The distinction between the function of the legislature and that of the regents, in respect to the University, is that between legislative and executive power. All the executive power over university affairs having been put in the regents by the constitution, none of it may lawfully be exercised or placed elsewhere by the legislature.

4. That result *held* so plainly a necessary consequence of the constitutional confirmation of the independent power of the Board of Regents that an adverse practical construction is disregarded. In construing a consti-

tutional provision resort must first be had to its letter and spirit in their application to the subject matter. If the meaning is plain, without going farther, it is not permissible to adopt any different practical construction, however well established it may be.

The following letter from the Attorney General was presented to the Board:

August 17, 1928

University of Minnesota,
Hon. Fred B. Snyder,
Minneapolis, Minnesota.

My dear Senator:

By your letter of August 14th you propound the following questions relative to the present membership of the board of regents of the university:

1. In your judgment should the board now sit with its ten appointed members and be presided over by President Coffman, who has already been elected by the board as president (that is chancellor), on the assumption that the governor may, or may not, appoint two additional members to make a full board of twelve; or
2. Is it your opinion that the present board should continue to act as now constituted and organized until the legislature meets?

Under the recent decision of our supreme court, it is my opinion that the organization of the board of regents is controlled by chapter 28 of the 1851 Statutes. The right of succession of the corporation through the selection of the members of the board of regents is integral with the existence of the corporation itself, and under the principles laid down by the supreme court the legislature was without power to alter the method of succession provided for by the 1851 statute. That statute provides for a board of twelve regents to be elected in joint convention of both branches of the legislature for the terms therein provided. It is clearly the right and duty of the legislature to elect the members of the board in the first instance. However, the statute further provides that:

"Whenever there shall be a vacancy in the office of regents of the university, from any cause whatever, it shall be the duty of the governor to fill such office by appointment, and the person or persons so appointed shall continue in office until the close of the session of the legislature, then next thereafter, and until others are elected in their stead."

No regents have been elected by the legislature for many years. Ten members have regularly been appointed by the governor, and three—the governor, the commissioner of education and the president of the university—have acted as members *ex officio*, all under a subsequent statute so providing.

It is my opinion that the ten members appointed by the governor are *de jure* members. It is true that the appointments were made under an ineffective statute, but the fact remains that the legislature's failure to act left vacancies in the membership of the board, that the governor had

authority to fill them by appointment, and that he has so filled them. The ten members so appointed now constitute the board of regents and will continue in office at least until the close of the next session of the legislature.

The governor, the commissioner of education and the president of the university are not de jure members of the board of regents, for the reason that they have not been selected as such in accordance with the terms of the statute of 1851. The question then arises whether they are de facto members under color of authority of the statute by virtue of which they have assumed to act. They were undoubtedly such members prior to the recent decision of our supreme court; but it is my opinion that, since the necessary result of that decision is to render unconstitutional the act under which they have assumed to hold office, their membership no longer exists in any character.

It follows, then, that there are two vacancies in the membership of the board. The governor may fill those vacancies by appointment under the statute of 1851. I might add that such appointments may be made even though the three ex officio members mentioned were members de facto, for a de facto member must yield to a member de jure.

The statute of 1851 requires the board of regents to elect a chancellor of the university, and provides that the chancellor shall be ex officio president of the board of regents. The election by the board of a president of the university probably satisfies this requirement and permits him to act as president of the board of regents; but I would suggest that the board provide by resolution to designate him chancellor as well.

Your truly,

G. A. YOUNGQUIST, *Attorney-General*

RULES AND REGULATIONS AT THE UNIVERSITY OF MINNESOTA

Following the Supreme Court decision it was necessary to re-write the *Rules and Regulations Governing the University* so that they would conform in every respect with this decision. The Board of Regents appointed a Rules Committee to consider this matter. This committee reported on June 15, 1929. Its report, which was adopted unanimously, reads as follows:

Voted unanimously to approve the following report of the Rules Committee of the Board of Regents consisting of Regents Gemmell, Snyder, Sundberg, and Williams:

MEETINGS

I. REGULAR MEETINGS

The annual meeting of the board shall be held on the second Tuesday in May of each year, except in the year 1929 in which the election shall be held at the meeting of the board to be held on June 15.

THE PRESIDENT'S REPORT

2. SPECIAL MEETINGS

Meetings of the board may be called by the president of the board or by any seven members thereof at such time and place as they may deem expedient, and a majority of said board shall constitute a quorum for the transaction of business, but a smaller number may adjourn from time to time.

(Laws of 1851, Chap. 3, Sec. 17)

3. PLACE OF MEETINGS

All meetings of the board shall be held at the University unless otherwise ordered by the board. (Min. B. R. May 1, 1895)

4. QUORUM

A majority of the entire board shall be necessary to constitute a quorum. (But a smaller number may receive the reports of committees and declare an adjournment; and if a majority of the members of the Executive Committee are present, those present may resolve themselves into a meeting of that committee.)

(Min. B. R. June 1, 1898)

5. BUSINESS BEFORE THE BOARD

Departments of the University having matters for consideration by the board of regents shall submit the same in writing to the president of the board, at least ten (10) days before the date of the regular meeting of the board at which action is expected. The president may then refer these matters to their proper committee in order that the committee may report thereon to the board. (Min. B. R. Oct. 1, 1908)

6. ORDER OF BUSINESS

The order of business unless otherwise ordered shall be as follows:

1. Reading and approval of the minutes of preceding meeting.
2. Reports of committees.
 - a. Standing committees.
 - b. Special committees.
 - c. President of the board.
3. Communications and resolutions.
4. Unfinished business.
5. New business.

(Min. B. R. June 1, 1898)

7. RULES OF PROCEDURE

All business coming before the board shall be conducted according to the general rules of parliamentary procedure. Each member of the board who is present shall vote on every question, unless excused from voting by the board. The ayes and noes shall be called and entered on the minutes upon the request of any member of the board.

8. MINUTES OF PROCEEDINGS

Minutes of the proceedings of the board shall be kept by the secretary. He shall cause them to be printed, bound, and preserved. He shall deliver a copy to each member of the Administrative Committee of the University Senate and provide the library of the University with at least five copies. As soon as practicable after the record of proceedings has been perfected, the secretary shall transmit to each member of the board of regents a copy of such record. All lengthy reports shall be referred to in the minutes, and shall be kept on file as part of the University records; but such reports shall not be incorporated in the minutes.

OFFICERS OF THE BOARD

I. ENUMERATION OF

The officers of the board shall consist of president, first vice-president, second vice-president, secretary, treasurer, and librarian. The "chancellor of the University shall be ex-officio president of the board of regents." The vice-presidents shall be elected from members of the board, but the secretary, the treasurer and the librarian may or may not be members of the board. The secretary may also serve as treasurer and librarian. The University comptroller may be elected secretary of the board.

2. MODE OF ELECTION AND TERM

The officers of the board, other than the president of the board, shall be elected by the board at the annual meeting in May of the odd numbered years and shall hold office for a term of two years and until their successors are elected and qualified; provided that such officers shall be elected at the meeting of the board to be held on June 15, 1929, and shall hold office until the annual meeting of the board in May, 1931, and until their successors are elected and qualified.

3. VACANCIES

In the event of a vacancy in any office of the board an election may be held for the unexpired term at any regular or special meeting of the board.

4. DUTIES OF THE CHANCELLOR AS EX-OFFICIO PRESIDENT OF
THE BOARD

The chancellor as ex-officio president of the board shall perform such duties as devolve upon him by law and as are usual to his office. He shall preside at all meetings of the board but the vice-presidents or other members may act as presiding officer at his request. When the office of president of the board is vacant, or the president is absent, the first vice-president or, in his absence, the second vice-president shall act as president pro tem. The president of the board shall appoint all standing committees and special committees except as otherwise ordered by the board. He shall act for the board as their agent for or on their behalf whenever requested to do so by the board.

THE PRESIDENT'S REPORT

5. VICE-PRESIDENTS

The first vice-president, or in his absence the second vice-president, shall, in the absence of the president, perform all the duties of the president, and they shall at any time perform such duties as the board may direct.

6. THE SECRETARY

It shall be the duty of the secretary to record all the proceedings of the board and carefully preserve all its books and papers, and to perform such other duties as the board may direct.

(Laws 1851, Chap. 3, Sec. 8).

7. THE TREASURER

The treasurer shall keep a true and faithful account of all moneys received and paid out by him and shall give such bonds for the faithful performance of the duties of his office as the regents may require.

(Laws 1851, Chap. 3, Sec. 8).

COMMITTEES OF THE BOARD

1. THE ENUMERATION OF

There shall be the following standing committees:

- The Executive and Finance Committee, of five members
- The Agricultural Committee
- The Committee on Buildings and Grounds
- The Committee on Salaries
- The Committee on Investments

And such consulting committees as the board may determine.
(Min. B. R. June 4, 1919).

2. MANNER OF APPOINTMENT

The standing committees shall be appointed by the president, or as otherwise ordered by the board, at the regular annual meeting for a term of two years. The president of the board shall be a member ex-officio with power to vote, of all such standing committees, except the consulting committees.

3. SPECIAL COMMITTEES

Special committees may be appointed at the will of the board to consider special subjects.

(Min. B. R. June 4, 1919).

4. MEETINGS

Meetings of committees may be called by the chairman and shall be called by the chairman upon the request of two members or upon the request of the president of the board. Whenever a meeting of any committee of the board is duly called, and one or more members of the com-

mittee meet, any member of the board not a regular member of the committee, who is present, may sit with the committee, and be deemed a member with all the powers of a regular member.

(Min. B. R. June 4, 1919).

5. MINUTES OF PROCEEDINGS

The secretary of the board shall be the secretary of all standing committees except the consulting committees. He shall keep the minutes of the meetings and shall cause them to be printed in the same form and copies thereof to be distributed in the same manner as the minutes of the meetings of the board of regents, and to be preserved among the records of the University. He shall also, upon the request of the chairman of any special committee, act as secretary of such special committee; but the minutes of the meeting shall not be printed unless so ordered by the committee.

(Min. B. R. June 4, 1919).

6. THE EXECUTIVE COMMITTEE

Membership

The executive committee shall be composed of five members of the board of regents. The first vice-president of the board shall be a member and act as chairman of the committee.

(Min. B. R. June 4, 1919).

Meetings

Meetings shall be called by the chairman of the committees. Such meetings shall be held at the University unless otherwise specified in the call or otherwise determined by the committee. Each member of the board of regents shall be authorized to attend and to take part in the meetings of the executive committee. It shall be the duty of the secretary to notify each member of the board of such meetings.

(Min. B. R. May 4, 1905).

Powers and Duties

The executive committee shall have general supervision of the buildings, grounds, and other property belonging to the University. It shall have charge of all expenditures directed by the board, unless otherwise directed by resolution of the board. It shall have general supervision of all financial interests of the University, subject to the rules and instructions of the board. It shall represent the board during the intervals between its meetings. All matters determined by the executive committee, however, shall be referred to the board for approval.

(Min. B. R. Dec. 10, 1889).

AMENDMENT TO RULES

The rules may be amended by a majority vote of the whole board at any meeting.

UNIVERSITY LIFE

UNIVERSITY LIFE

REPORT OF THE COMMITTEE ON UNIVERSITY FUNCTIONS

CONVOCATIONS HELD, 1928-29

- July 26: Summer Session commencement exercises: Arnold Bennett Hall, President of the University of Oregon, "Demagogues and Education"
- October 4: Opening convocation: Lotus D. Coffman, President of the University, "Address of Welcome"
- October 20: Laying of the Cornerstone of the Northrop Memorial Auditorium: Lotus D. Coffman, President of the University, "The Auditorium, a Center of University Influence"; Charles G. Ireys, '00, "Laying the Cornerstone"
- October 25: Debate, "The Rule of Mussolini—Is It Injuring Italy?": Dr. Vincenzo Nitti, Author, Historian, and Lecturer, and Dr. Samuel S. McClure, Editor of *McClure's Magazine*
- November 1: Yusuke Tsurumi, Statesman and Publicist, "Japan—China—Russia"
- November 8: Henry Suzzalo, Visiting Carnegie Professor of International Relations in Europe, "The Trouble Zone of Europe"
- November 15: Rabbi Samuel H. Goldenson, Rodef Shalom Congregation of Pittsburgh, "The Lot of the Ideal"
- November 22: Joseph Dubray, Secretary of the American Society of Cinematographers, "The Historians of the New Era—the Men Who Make Motion Picture Records"
- December 6: State Day convocation: Harold L. Stassen, Law '29, Former Intercollegiate Debater and University Representative in the Northern Oratorical League, "The Student Point of View"; Lotus D. Coffman, President of the University, "Response"
- December 13: Student Athletic Assembly: Dr. Clarence W. Spears, Head Football Coach, "Characterization of Players"; Fred W. Luehring, Director of Athletics, "Announcement of 'M' Awards for the Past Year"; Lotus D. Coffman, President of the University, "Awarding of M's."
- December 20: Fall quarter commencement exercises: Kenneth G. Matheson, President of Drexel Institute, Philadelphia, "Ideal for University Students"
- January 24: The Reverend Charles W. Gilkey, Dean of the Chapel, University of Chicago, "What Is Religion?"
- January 31: Norman Angell, Author and Lecturer, "Ideas Which Are Assassins"
- February 7: Debate—"Resolved: That Coeducation As Conducted in American State Universities Is a Desirable Form of Education": Beatrice Forbes-Robertson Hale, English Publicist and Author, and Rebecca Hooper Eastman, American Author

- February 21: Band convocation: The University Band, Michael Jalma, Director
- March 21: Winter quarter commencement exercises: The Reverend Matthew Schumacher, President of the College of Saint Thomas, "The Days Ahead"
- April 4: Richard Burton, Sometime Professor and Head of the English Department, University of Minnesota, "Useless Studies in Later Life"
- April 18: Albert E. Jenks, Professor and Chairman of the Department of Anthropology, University of Minnesota, "Field Researches in the Culture of Prehistoric Americans"
- April 25: Herbert Heaton, Professor of History, University of Minnesota, "From Shirt Sleeves to Shirt Sleeves"
- May 2: Monsignor Humphrey Moynihan, Rector, Saint Paul Seminary, "Religion and Modern Thought"
- May 16: Cap and Gown Day convocation: Henry W. Chase, President of the University of North Carolina, "Scholarship and American Life"; John A. Priest, President of the All-University Senior Class, "Presentation of the Class of 1929"; Lotus D. Coffman, President of the University, "Response"
- June 6: Carl Sandburg, Poet, "An Hour with Carl Sandburg"
- June 16: Baccalaureate service: The Reverend Otto Mees, President, Capital University, Columbus, and head of the National Lutheran Educational Conference, "Your Crown"
- June 17: Commencement exercises in the Stadium: Lotus D. Coffman, President of the University, "Charge to the Class"

CONVOICATIONS HELD, 1929-30

- July 25: Summer Session commencement exercises: Henry F. Nachtrieb, Professor Emeritus of Zoology, "Yesterday—Today—Tomorrow"
- October 3: Opening convocation: Lotus D. Coffman, President of the University, "Address of Welcome"
- October 24: The Reverend Shailer Mathews, Dean of Divinity School, University of Chicago, "What Leads to Revolutions"
- October 31: Ross A. Gortner, Professor of Agricultural Biochemistry and Chief of the Division of Agricultural Biochemistry; Elvin C. Stakman, Professor of Plant Pathology, "Scientific Pioneering to Achieve Better Living in the Northwest"
- November 7: Student convocation: Edward Martini, Law '30, representing the All-University Council, "Building Minnesota Spirit"
- December 19: Fall quarter commencement exercises: William B. Stout, President and General Manager, Stout Engineering Laboratories and Vice President and General Manager, Stout Metal Airplane Company, "This Changing World"
- January 9: State Day convocation: The Honorable Julius H. Barnes, "Modern Business and the Trained Mind"
- January 16: Debate: Horace James Bridges, Leader of the Chicago Ethical Society, and John Cowper Powys, Author and Lecturer, "Are Old Time Moral Standards Obsolete?"

- January 30: Military convocation: Colonel Paul V. McNutt, Dean of the Law College, Indiana University, "Obligations of Citizenship"
- February 6: Thornton Wilder, Author and Lecturer, "The Future of American Literature"
- February 20: William Watts Folwell Memorial convocation: Dr. Kendrick Charles Babcock, Dean of the College of Liberal Arts and Sciences, and Provost, University of Illinois
- February 27: Samuel C. Lind, Professor and Director of the School of Chemistry, and John T. Tate, Professor of Physics, "Recent Thought on the Nature of Matter"
- March 6: The Reverend John A. Ryan, Professor of Moral Theology and Industrial Ethics, Catholic University of America, "The New Morality and Its Illusions"
- March 20: Winter quarter commencement exercises: Robert Maynard Hutchins, President of the University of Chicago, "On Leaving College"
- April 3: Miss Maud Sheerer, Dramatic Impersonator, "Broken Dishes"
- April 10: Hubert Phillips, of London, Economic Adviser of the British Liberal Party, "Britain at the Cross-Roads—Peace and Disarmament"
- May 8: Rabbi Solomon B. Freehof, Kehilath Anshe Mayriv Temple of Chicago, "The Basis of Religious Liberalism—A Study of Group Psychology"
- May 15: Cap and Gown Day convocation: Winston L. Molander, President of the All-University Senior Class, "Presentation of the Class of 1930"; Lotus D. Coffman, President of the University, "Response"
- May 29: Music convocation: Faculty of the Department of Music and the University Band
- June 8: Baccalaureate service: The Reverend Thomas W. Graham, Dean of the Graduate School of Theology, Oberlin, "The Riddle of Life"
- June 9: Commencement exercises in the Stadium: Lotus D. Coffman, President of the University, "Charge to the Class"

Attention is called to the fact that the Northrop Memorial Auditorium was available for the opening convocation, held heretofore in the Stadium, and was used throughout the year for convocations, concerts, lectures, and special functions, as well as for the fall and winter graduation exercises. It is impossible to estimate the value of this structure to the cultural life of the campus.

One other marked change in procedure is recorded, viz., the holding of the June commencement exercises in the evening. This is the first time in the history of the University that the evening hour was used for this purpose. The exercises were conducted at eight o'clock, preceded by the senior procession through the knoll and across Northrop Field. Adequate lighting illuminated the stage and the bowl of the Stadium, making altogether a spec-

tacle so attractive as to insure the permanency of the plan. A conservative estimate places the attendance at approximately 18,000.

The number of candidates for each of the graduation periods of 1928-29 and 1929-30 is as follows:

1928-29	
First Summer Session, July 26, 1928.....	159
Second Summer Session, September 1, 1928.....	136
Fall quarter, December 20, 1928.....	258
Winter quarter, March 21, 1929.....	181
Spring quarter, June 17, 1929.....	1,459
	<hr/>
Total candidates for the year.....	2,193
1929-30	
First Summer Session, July 25, 1929.....	183
Second Summer Session, August 31, 1929.....	124
Fall quarter, December 19, 1929.....	286
Winter quarter, March 20, 1930.....	250
Spring quarter, June 9, 1930.....	1,536
	<hr/>
Total candidates for the year.....	2,379
	<hr/>
Grand total for the biennium.....	4,572

RELIGIOUS WORKERS CONFERENCE

In November, 1928, the University of Minnesota acted as host to the eighth annual conference of the Religious Workers Conference, sponsored by the Minnesota Association of College Presidents. The meetings were open to the public. Speakers included Livingston C. Lord, president of Eastern Illinois State Teachers College, Russell Stafford, pastor of Old South Church in Boston, Samuel S. Goldenson, Rabbi of Rodef Shalom Congregation, Pittsburgh, LeRoy Arnold, of Hamline University, St. Paul, Samuel F. Franklin, of Macalester College, St. Paul, John Lewis Gillin, University of Wisconsin, Bishop William F. Oldham, of Columbus, Ohio, Reverend Lawrence F. Ryan, pastor of the Cathedral of Saint Paul, Dean W. C. Coffey, and Professors Herbert E. Chamberlain, D. H. Davis, J. Arthur Harris, Albert E. Jenks, David F. Swenson, and John T. Tate, and Mr. James C. Lawrence, of the University of Minnesota. Proceedings of the conference were printed and distributed by the University Press.

SPECIAL LECTURERS

An innovation of the past year was the engagement of three special lecturers who came to the University not only to speak to general audiences but to meet classes that could profit by their particular specialties and to consult with interested faculty members and graduate students. These three were Vilhjalmar Stefansson, the Arctic scientist and explorer, Hubert Phillips, economic adviser to the British Liberal Party, and A. C. Josephus Jitta, Dutch publicist and editor of *Die Groene Amsterdammer*.

Mr. Stefansson was at Minnesota a day and a half a week over a period of five weeks in January and February. Besides a series of set public lectures, delivered once a week, he took part in many prearranged conferences and spoke to a number of classes. Mr. Jitta and Mr. Phillips followed a similar schedule during their visits in April. Dr. Jitta discussed Holland, the Dutch colonies, oil, international affairs from the point of view of his country, and the like. Mr. Phillips, in America partly to make a study of the American telephone system, dealt with the economic and political problems of Great Britain and lectured on current conditions in that nation and empire. Mr. Stefansson's field, the Arctic, was interpreted by him in a way that produced widespread interest.

UNIVERSITY ARTISTS COURSE

The University Artists Course was presented this year in the Cyrus Northrop Memorial Auditorium. In spite of the fact that this beautiful new concert hall has a seating capacity nearly twice that of the old Armory, it was filled for every concert.

The first two concerts were dedicatory and were presented by the Minneapolis Symphony Orchestra with Henri Verbruggen conducting, Eunice Norton appearing as guest artist, and the Boston Symphony Orchestra with Serge Koussevitzky conducting.

Other artists appearing in recital during the season were Roland Hayes, tenor; Sigrid Onegin, contralto; Mischa Levitzki, pianist, and the St. Olaf choir.

There is evident each year an appreciable increase in interest in this concert course which brings the best in music to the students and faculty at lowest possible rates.

MOTHER'S DAY AND DAD'S DAY

Mother's Day, first held in the spring of 1924, and Dad's Day, established the next fall, have now become firmly fixed as successful parts of the University's plan for bringing parents into closer touch with the institution. On each occasion the mothers, or fathers, as the case might be, have been asked to set aside one day for a campus visit. They were urged to attend classes with their children, meet their friends, inspect their living quarters, and especially, make the acquaintance of some members of the faculty. It has become the custom to have Mother's Day in May, approximately at the time of the national Mother's Day, and to set Dad's Day on some autumn Saturday so that the fathers might take in a football game.

During the first four or five years between 1,000 and 2,000 came to the campus on each occasion; of these between 700 and 1,000 remained for the evening dinner in the Minnesota Union.

In 1929 the committee in charge of Dad's Day decided on a change of routine and voted that fathers should bring their sons or daughters to the dinner. The response was so overwhelming that the Union ballroom could not care for the number who wished to attend.

The result of this experience was that the Mother's Day banquet in May, 1930, was served in the University Armory, where the attendance was so large that all records of other years were broken. Another innovation was the use of the Northrop Auditorium for a reception of visiting mothers by the deans and their wives.

Plans for making still further improvements of the Mother's and Dad's Day arrangements are under consideration by the committee as a result of the increased interest created by joint attendance of parents and children at the dinner last spring and fall.

DISTINCTIVE HONORS CONFERRED UPON MEMBERS
OF THE STAFF

SCIENTIFIC AWARDS

Administration—

President Lotus Delta Coffman was awarded the honorary degree of doctor of laws by Columbia University, on the occasion of the one hundred seventy-fifth anniversary of the institution; was awarded the honorary degree of doctor of science in education by George Washington University; and was awarded the honorary degree of doctor of humane letters by the University of Denver.

College of Science, Literature, and the Arts—

Frederick Klæber, on the anniversary of his sixty-fifth birthday and his thirty-fifth year at the University of Minnesota, was honored with the publication of a memorial book called *Studies in English Philology, An English Miscellany in Honor of Professor Klæber*.

Norman Wilde, professor of philosophy, was awarded the honorary degree of doctor of literature by Columbia University on October 31, 1929.

William S. Cooper, professor of botany, was awarded the honorary degree of doctor of science by Alma College, Michigan, June, 1930.

School of Chemistry—

Nelson W. Taylor was awarded a Guggenheim Fellowship for research and study abroad for the year 1929-30.

College of Agriculture, Forestry and Home Economics, and Department of Agriculture—

Jonas J. Christensen was awarded a Guggenheim Fellowship for research and study abroad, 1930-31.

Forrest R. Immer was awarded a National Research Council Fellowship for year's study in Europe, 1930-31.

Frederick B. Hutt was awarded the Poultry Science Association's National Prize of \$100 for outstanding research.

Clarence E. Mickel was awarded a Guggenheim Fellowship for research and study abroad, 1930-31.

Harold P. Morris was awarded a National Research Council Fellowship for the year 1930-31.

Andrew Boss was given the title, doctor of agriculture, by the Kansas State Agricultural College. A special recognition of the work of Professor Andrew Boss in the fields of animal husbandry and farm management was given by the American Society of Animal Production.

Medical School—

Elias P. Lyon, dean, was awarded the honorary degree of doctor of science by the University of Southern California, June, 1930.

School of Mines and Metallurgy—

Oscar E. Harder was awarded the Henry Marion Howe medal by the American Society for Steel Treating for 1928.

Ralph L. Dowdell was awarded the Henry Marion Howe medal by the American Society for Steel Treating for 1929.

College of Pharmacy—

Frederick J. Wulling, dean, was awarded the honorary degree of doctor of science by Columbia University and was elected for the twenty-second consecutive time to the chairmanship of the Scientific and Practical Section of the Minnesota Pharmaceutical Association.

School of Business Administration—

Alvin H. Hansen was awarded a Guggenheim Fellowship for research and study abroad for the year 1928-29.

Bureau of Social Hygiene—

Chloe Owings was awarded an honorary degree of doctor of letters by Knox College.

HONORS IN LEARNED SOCIETIES

College of Science, Literature, and the Arts—

Henry A. Erikson was elected president of the local chapter of Sigma Xi.

Colbert Searles was appointed to the Committee on Grants and Fellowships of the American Council of Learned Societies.

August C. Krey was appointed United States representative on the Commission on History Teaching at a meeting of the International Congress of Historical Scientists, held in Oslo, Norway, in 1929.

College of Engineering and Architecture—

Burton J. Robertson was elected president of the Minnesota Section of the Society for the Promotion of Engineering Education and treasurer of the Minnesota Federation of Architectural and Engineering Societies.

Frank B. Rowley was elected vice-president of the American Society of Heating and Ventilating Engineers.

School of Chemistry—

Charles A. Mann was elected national president of Alpha Chi Sigma, professional chemical fraternity.

College of Agriculture, Forestry, and Home Economics and Department of Agriculture—

Walter C. Coffey, dean, was elected vice-president for Section O (Agriculture), American Association for the Advancement of Science.

Clyde H. Bailey was elected president of the American Chemical Society, Midwest Meeting, and editor-in-chief of *Cereal Chemistry*.

Ross A. Gortner was elected secretary-treasurer, Colloid Division of the American Chemical Society; honorary member of the Des Moines Academy of Medicine; member of the Committee on Chemistry of Colloids organized by the National Research Council; member of the Division of Biology and Agriculture, representing the American Society of Biological Chemists in the National Research Council; member of the American Committee on Biochemical Nomenclature organized by the Division of Chemistry and Chemical Technology, National Research Council; member of the International Committee on Biochemical Nomenclature, organized by the International Union of Pure and Applied Science; associate editor of the *Journal of the American Chemical Society*; and associate editor of the *Journal of Physical Chemistry*.

Harold K. Wilson was elected fellow of the Association for the Advancement of Science.

Dr. C. P. Fitch was granted an honorary degree of doctor of science by the Iowa State College.

Medical School—

Paul H. Fesler was elected vice-president of the American Hospital Association.

School of Mines and Metallurgy—

Oscar E. Harder was elected a director of the American Society for Steel Treating for the years 1930 and 1931.

College of Pharmacy—

Earl B. Fischer was elected a member of the honorary society, Rho Chi.

Charles V. Netz was elected a member of the honorary society, Rho Chi.

School of Business Administration—

Russell A. Stevenson, dean, was elected vice-president of the American Association of University Instructors in Accounting.

Frederick B. Garver was appointed to the Board of Editors of the *American Economic Review*.

Ernest A. Heilman was appointed associate editor of the *Accounting Review*.

PUBLIC SERVICE

Administration—

William T. Middlebrook was appointed by Mayor William F. Kunze, of Minneapolis, to serve as a member of the commission of citizens appointed to study the practices and procedures of our city government. Mr. Middlebrook was appointed vice-chairman of a subcommittee on accounting.

College of Agriculture, Forestry, and Home Economics, and the Department of Agriculture—

Walter C. Coffey, dean, was elected a director of the International Livestock Exposition; president of the Twin City Unit of the National Dairy Council; and a member of the Committee on Country Churches, American Country Life Association.

William H. Alderman was appointed by the secretary of agriculture, a member of the Second Federal Committee on the Mediterranean Fruit Fly, to investigate conditions in Florida.

Clarence H. Eckles was chosen by fifty-five leading authorities in a survey made by the *Dairy Farmer*, Des Moines, Iowa, as one of the "ten master minds of the dairy industry."

Theophilus L. Haecker, professor emeritus, was also chosen one of the ten master minds of the dairy industry.

Albert M. Field was made state adviser for Future Farmers of America.

Leroy S. Palmer was appointed by the secretary of agriculture, a member of the Committee on Vitamin Content of Food in Relation to Human Nutrition.

Arthur G. Ruggles was elected a member of the National Plant Board.

Arthur C. Smith was chosen editor of *Standard of Perfection*, a handbook for poultry judges throughout the United States and Canada.

Elvin C. Stakman was chosen guest professor, University of Halle, 1930, to give lectures in the German language.

Ashley V. Storm was made a member of the National Executive Council, Boy Scouts of America.

Maurice C. Tanquary was elected president of the American Honey Producers' League.

College of Engineering and Architecture—

Axel B. Algren was made a member of the Technical Advisory Committee on Heat Transmission of the American Society of Heating and Ventilating Engineers.

Frederic Bass was made a member of the Committee on Engineering Education of the American Railway Association and also a member of the Subcommittee on Engineering of the Mayor's Committee of Minneapolis.

John M. Bryant was made chairman of the Committee on Education of the Illuminating Engineering Society.

Elmer W. Johnson was made a member of the Committee on Education of the Illuminating Engineering Society.

Roy C. Jones, with F. H. Bosworth of Cornell University, has been designated to make a survey of architectural education in the United States and Canada under the auspices of the Association of Collegiate Schools of Architecture and with the support of the Carnegie Corporation.

John H. Kuhlmann was made chairman of the Student Activities Committee of the American Institute of Electrical Engineers for the Great Lakes District.

Fred C. Lang was made chairman of the Special Committee on Curing Concrete Pavements and chairman of the Subcommittee on Effect of Various Degrees of Surface Manipulation in Finishing Concrete Pavements, in the Highway Research Board of the National Research Council. In the American Association of State Highway Officials, he was made chairman of the Division of Problems Relating to Specifications and Tests, a member of a special committee to prepare standard specifications, and the representative of the association on the Joint Committee on Concrete Culvert Pipe. In the American Society for Testing Materials, he was made a member of the Committee on Concrete and the Committee on Road and Paving Materials.

Ora M. Leland was made a member of the Committee on Student Chapters of the American Society of Civil Engineers and a member of the Committee on Engineering Experiment Stations of the Association of Land Grant Colleges and Universities.

John I. Parcel was made a member of the Manual Committee of the American Society of Civil Engineers.

George C. Priester was made a member of the Executive Committee of the North Chapter of the American Society for Steel Treating.

Frank B. Rowley was made chairman of the Committee on Research of the American Society of Heating and Ventilating Engineers, member of its Technical Advisory Committee on Heat Transmission, and chairman of its Technical Advisory Committee on Air Cleaning Devices. He was made a member of the Citizens Committee appointed by the Board of Education of Minneapolis to make studies for new school buildings.

School of Chemistry—

Samuel C. Lind was elected a member of the National Academy of Sciences.

Hervey H. Barber was chosen chairman of the Committee for the State of Minnesota on Prize Essays for the American Chemical Society.

Lloyd H. Reyerson was appointed by Johns Hopkins University a member of the committee to select the Hormel Foundation fellow from Minnesota. He was elected councillor of the American Chemical Society from the Minnesota Section.

College of Education—

Fred Engelhardt was appointed specialist in administration in the National Survey of Secondary Education.

School of Business Administration—

Roy G. Blakey was appointed a member of the Minneapolis Survey Commission.

CHANGES IN THE FACULTIES

CHANGES IN THE FACULTIES

APPOINTMENTS, 1928-29

DEANSHIP OF COLLEGE OF DENTISTRY

William F. Lasby as dean of the College of Dentistry

The resignation of Dr. Alfred Owre as dean of the College of Dentistry to accept the deanship of the College of Dentistry at Columbia University, was recorded in my 1927-28 report. Dr. W. F. Lasby served as acting dean the following two years. His administration during these two years merited and received almost unanimous approval for his election as dean. The Board of Regents on June 15, 1929, appointed him dean of the College of Dentistry, a title for which he had demonstrated his ability and fitness.

ASSISTANT DEAN

Otis C. McCreery as assistant dean of student affairs

B.S. 1922, M.A. 1928, University of Minnesota.

PROFESSORS

John M. Bryant as professor and head of the Department of Electrical Engineering beginning with the year 1928-29

B.S. 1901, Worcester Polytechnic Institute; E.E. 1909, M.S. 1911, University of Illinois.

Oscar B. Jesness as chief and professor of farm management and agricultural economics beginning September 1, 1928

B.S. 1912, M.S. 1924, Ph.D. 1928, University of Minnesota.

Maurice C. Tanquary as professor of apiculture beginning with year 1928-29

B.S. 1903, Vincennes University; BA. 1907, M.A. 1908, Ph.D. 1912, University of Illinois.

ASSOCIATE PROFESSORS

Oliver P. Field as associate professor of political science beginning with the year 1928-29

B.A. 1919, St. Olaf College; M.A. 1924, University of Minnesota; LL.B. 1927, University of Indiana; S.J.D. 1928, Yale University.

Karl P. T. Friederichs as associate professor of entomology and economic zoology from October 1, 1928 to March 31, 1929

Doctor's degree in 1905 from University of Rostock, Germany.

Roy E. Marshall as associate professor of horticulture from November 1, 1928 to June 30, 1929

B.S. 1913, University of Nebraska; M.S. 1915, Oregon Agricultural College.

Esther McGinnis as associate professor in the Institute of Child Welfare beginning July 30, 1928

B.S. 1915, Ohio University; M.S. 1923, Columbia University; Ph.D. 1928, University of Minnesota.

Robert W. Murchie as associate professor of sociology for 1928-29

M.A. 1906, University of Glasgow; Ph.D. 1927, University of Minnesota.

Laurence M. Winters as associate professor of animal husbandry beginning with the year 1928-29

B.S. 1919, University of Minnesota; M.S. 1920, University of Iowa.

ASSISTANT PROFESSORS

Eva L. Blair as home demonstration organization specialist with rank of assistant professor in agricultural extension for 1928-29

B.S. 1912, University of Illinois.

Walter Blair as assistant professor of English in General Extension Division for 1928-29

Ph.B. 1923, Yale University; M.A. 1928, University of Chicago.

Ruth E. Boynton as chief medical adviser for women in Students' Health Service and assistant professor in Department of Preventive Medicine and Public Health for 1928-29

B.S. 1918, University of Wisconsin; M.B. 1920, M.D. 1921, M.S. 1927, University of Minnesota; served as assistant to director of health service and instructor and assistant professor in Department of Preventive Medicine and Public Health at the University of Minnesota from December 15, 1921 to October 1, 1927.

Helen D. Bragdon as assistant professor in the College of Education for 1928-29

B.A. 1918, Mount Holyoke College; Ed.M. 1925, D.Ed. 1928, Harvard University.

Rex W. Cox as assistant professor of farm management and agricultural economics for three years beginning February 1, 1929

B.S. in Agric. 1914, University of Illinois; M.S. 1923, Cornell University.

Troy M. Currence as assistant professor of horticulture beginning with 1928 Summer Session

B.S. 1923, M.S. 1925, University of West Virginia.

Captain Murray T. Davenport as assistant professor of military science and tactics beginning September 1, 1928

B.A. 1905, B.L. 1908, University of Minnesota; commissioned November 27, 1917 as first lieutenant of infantry; promoted to captain of infantry August 23, 1918.

Arthur L. Delez as assistant professor of veterinary medicine for 1928-29

D.V.M. 1925, Colorado Agricultural College; M.S. 1928, Michigan State Agricultural College.

Mabelle S. Ehlers as assistant professor of home economics and assistant manager of dining hall for 1928-29

B.S. 1906, Kansas State Agricultural College; M.A. 1927, University of Chicago.

Elizabeth G. Gardiner as assistant professor of sociology for 1928-29

B.S. 1927 Columbia University; certificate from Simmons College School for Social Work.

Ambert B. Hall as assistant professor in the College of Dentistry for 1928-29

D.D.S. 1922, University of Minnesota; was an instructor in the College of Dentistry, University of Minnesota, from 1924-25 until the close of 1926-27, when he resigned to accept a position at Columbia University.

Major Earl L. Hering as assistant professor of military science and tactics beginning May 31, 1928

D.D.S. 1908, University of Michigan.

Kate Hevner as assistant professor of psychology for 1928-29

B.A. 1920, Wilson College; M.A. 1923, Columbia University; Ph.D. 1928, University of Chicago.

Gustav O. Hoglund as assistant professor of aeronautical engineering for 1928-29

B.S. 1925, University of Michigan.

Lura C. Hutchinson as assistant professor in the Division of Library Instruction for 1928-29

B.A. 1908, University of Minnesota; certificate from Western Reserve Library School in 1914.

- Frederick B. Hutt as assistant professor of poultry husbandry beginning November 1, 1928
B.S. 1923, Ontario Agricultural College (Toronto University); M.S. 1925, University of Wisconsin; M.A. 1927, University of Manitoba.
- Palmer O. Johnson as assistant professor to assist with Land Grant College Survey beginning August 1, 1928
B.A. 1912, University of Wisconsin; B.S. 1921, M.A. 1926, Ph.D. 1928, University of Minnesota.
- Archie N. Jones as assistant professor of public school music for 1928-29
Diploma in music 1924 from University of Nebraska School of Music.
- James R. Learmonth as assistant professor of surgery on the Mayo Foundation for 1928-29
M.B. and Ch.B. 1921, Ch.M. 1927, University of Glasgow.
- Lewis E. Longley as assistant professor of horticulture beginning April 1, 1929
B.A. 1904, Coe College; M.S. 1913, Washington State College.
- George T. McDowell as assistant professor of English for 1928-30
B.A. 1915, University of Michigan; M.A. 1916, Harvard University; Ph.D. 1928, Yale University.
- Robert P. McLaughlin as assistant professor of forestry for 1928-29
B.S. in Forestry 1925, University of Idaho; M.F. 1926, Yale Forestry School.
- Mary M. Miller as home management specialist with the rank of assistant professor in agricultural extension beginning October 1, 1928
B.S. 1915, North Dakota Agricultural College; B.S. 1918, Columbia University; supervisor's diploma in 1918 from Teachers College
- Orrin W. Potter as assistant professor of drawing and descriptive geometry for 1928-29
E.M. 1914, University of Minnesota.
- Julius Romness as assistant professor of agricultural engineering beginning November 1, 1928
B.A. 1922, University of Minnesota.

Allan F. Saunders as assistant professor of political science for 1928-29

B.A. *cum laude*, 1918, Amherst College; M.A. 1920, Ph.D. 1927, University of Wisconsin.

Edward P. Sheiry as assistant professor of civil engineering for 1928-29

B.S. in C.E. 1924, M.S. in C.E. 1928, Massachusetts Institute of Technology.

Dora V. Smith as assistant professor in the College of Education for 1928-29

B.A. 1916, M.A. 1919, Ph.D. 1928, University of Minnesota.

Captain William G. Walker as assistant professor of military science and tactics beginning with year 1928-29

Louise B. Wilson as assistant professor and extension worker in Institute of Child Welfare for 1928-29

B.S. 1920, Columbia University; M.A. 1929, University of Michigan.

PROFESSORIAL LECTURERS

Solomon M. Delson as professorial lecturer of Romance languages from November 1928 to June 30, 1929

Ph.B. 1907, University of Chicago; attended University of Grenoble, France, and University of Paris in 1908.

Edward L. Harvey as professorial lecturer in history during 1928-29

B.A. 1915, M.A. 1921, Oxford University.

Einar Johanson as professorial lecturer in history from April 1 to June 15, 1929

B.A. 1908, Augustana College; M.A. 1914, University of Wisconsin; Ph.D. 1920, University of Chicago.

James V. Uspensky as professorial lecturer in mathematics from May 1 to August 31, 1929

B.A. 1906, Ph.D. 1910, University of Petrograd.

Alexander Weinstein as professorial lecturer in genetics for 1928-29

B.S. 1913, M.A. 1914, Ph.D. 1917, Columbia University.

Jerry E. Wodsedalek as professorial lecturer in zoology for 1928-29

Ph.B. 1910, Ph.M. 1911, Ph.D. 1913, University of Wisconsin.

APPOINTMENTS, 1929-30

PROFESSORS

Edward U. Condon as professor of theoretical physics beginning with year 1929-30

B.A. 1924, Ph.D. 1926, University of California.

Clifford C. Crump as professor of astronomy for 1929-30

B.S. 1912, Earlham College; M.A. 1913, Ph.D. 1915, University of Michigan.

Harl R. Douglass as professor of education for 1929-30

B.S. 1915, M.A. 1921, University of Missouri; Ph.D. 1924, Stanford University.

Major John H. Hester as commandant and professor of military science and tactics beginning with the year 1929-30

ASSOCIATE PROFESSORS

John D. Akerman as associate professor of aeronautical engineering for 1929-30

B.S. 1925, University of Michigan.

Halbert L. Dunn as associate professor of biometry and statistical medicine in Graduate School of Mayo Foundation beginning July 1, 1929

B.A. 1917, M.A. 1919, M.B. 1922, M.D. 1923, Ph.D. 1923, University of Minnesota.

George Glockler as associate professor in the School of Chemistry beginning with year 1929-30

B.S. 1915, M.S. 1915, University of Washington; Ph.D. 1923, University of California.

Edwin C. Johnson as associate professor of farm management and agricultural economics beginning September 1, 1929

B.S. 1920, Ph.D. 1929, University of Minnesota.

Charles A. Koepke as associate professor of mechanical engineering for 1929-30

B.S. in Mech. Eng. 1920, Purdue University; M.S. in Mech. Eng. 1928, University of Colorado.

ASSISTANT PROFESSORS

Ralph H. Brown as assistant professor of geography for three years beginning with the year 1929-30

B.S. 1921, University of Pennsylvania; Ph.D. 1925, University of Wisconsin.

George T. Caldwell as assistant professor of pathology beginning July 1, 1929

B.A. 1910, M.A. 1913, University of Ohio; Ph.D. 1919, University of Chicago; M.D. 1919, Rush Medical College.

Rufus J. Christgau as assistant professor at the Northwest School and Station (Crookston) beginning October 1, 1929

B.S. 1925, University of Minnesota.

Lieutenant Vincent J. Conrad as assistant professor of military science and tactics beginning with the year 1929-30

Charles R. Donham as assistant professor of veterinary medicine beginning July 1, 1929

D.V.M. 1921, Iowa State College; M.S. 1928, Oregon State Agricultural College.

Samuel Eddy as assistant professor of zoology for 1929-30

B.A. 1924, Milliken University; M.A. 1925, Ph.D. 1929, University of Illinois.

Lieutenant Richard A. Ericson as assistant professor of military science and tactics beginning with year 1929-30

Belle O. Fish as extension specialist in child development with rank of assistant professor in Agricultural Extension beginning August 1, 1929

B.S. 1907, Montana State College; M.S. 1929, Iowa State College.

Edwin H. Ford as assistant professor of journalism for 1929-30

B.A. 1915, Stanford University; M.A. 1927, Harvard University; M.S. 1928, Columbia University.

Lieutenant Harlan N. Hartness as assistant professor of military science and tactics beginning with year 1929-30

Clarence P. Hotson as assistant professor of English, General Extension Division for 1929-30

B.S. 1921, Cornell University; M.A. 1923, Harvard University.

William McDonald as assistant professor of history for 1929-30

B.A. 1922, Georgetown University; B.A. 1927, Oxford University, England; Ph.D. 1929, Cornell University.

- Lieutenant Rex W. Minckler as assistant professor of military science and tactics beginning with year 1929-30
- Edward Moren as assistant professor of surgery beginning November 16, 1929
M.D. 1906, University of Minnesota.
- Frederick L. Pfeiffer as assistant professor of German for 1929-30
Baccalaureate degree, 1917, Oberreal College (Frankfurt-main); Ph.D. *summa cum laude* 1922, University of Zurich, Switzerland.
- Arne G. Tolaas as assistant professor of horticulture for three years beginning with the year 1929-30
B.S. 1911, M.S. 1912, University of Minnesota.
- Everard M. Upjohn as assistant professor of fine arts in the College of Science, Literature, and Arts, for three years beginning with 1929-30
B.A. 1925, Harvard College; M.Arch. 1929, Harvard Architectural School.
- James R. Van Dyke as assistant professor of mechanical engineering for 1929-30
B.S. 1918, M.E. 1922, Pennsylvania State College.
- Donald S. Villars as assistant professor of physical chemistry for 1929-30
B.A. 1921, Wilmington College; M.S. 1922, Ph.D. 1924, University of Ohio.
- Major William C. Webb as assistant professor of military science and tactics beginning January 16, 1930
D.D.S. 1914, Kansas City Dental College.
- James D. Winter as assistant professor of entomology and economic zoology beginning September 1, 1929
B.S. 1923, M.S. 1929, University of Minnesota.

PROFESSORIAL LECTURERS

- Jean Boyer as professorial lecturer in Romance languages for 1929-30
Baccalauréat de l'Enseignement Secondaire, 1921, Lycée National; Licence en Droit 1924, Licence ès Lettres, 1926, Université de Bordeaux.
- Harold C. Deutsch as professorial lecturer in history for 1929-30
B.A. 1924, M.A. 1925, University of Wisconsin; M.A. 1927, Ph.D. 1929, Harvard University.

LEAVES OF ABSENCE

- Joseph W. Beach, professor of English, without salary for 1928-29
- Hilding Berglund, professor and head of Department of Medicine, without salary from August 1, 1928 to June 30, 1929, to accept a visiting professorship at Peking Union Medical College.
- Theodore C. Blegen, professorial lecturer in history, without salary for 1928-29 to accept a Guggenheim fellowship for study in Norway.
- F. Stuart Chapin, professor and chairman of the Department of Sociology, without salary for 1928-29 to organize *Journal of Social Science Abstracts* of the Social Science Research Council.
- Alvin H. Hansen, professor in School of Business Administration, sabbatical furlough for 1928-29.
- William L. Hart, professor of mathematics, sabbatical furlough for 1928-29 for mathematical research at Chicago, Cambridge, and Pasadena, California.
- William P. Kirkwood, professor and editor, sabbatical furlough for 1928-29 to study rural journalism problems in the South and Pacific coast.
- August C. Krey, professor of history, without salary for the spring quarter of 1928-29.
- H. E. Michelson, professor in the Medical School, with salary from April 12 to May 31, 1929 for travel abroad.
- John I. Parcel, professor of civil engineering, without salary for 1928-29.
- Wilfred G. Brierley, associate professor of horticulture, sabbatical furlough from November 1, 1928 to June 30, 1929, for study at Michigan State Agricultural College.
- Clara M. Brown, associate professor of home economics, sabbatical furlough for the winter quarter of 1928-29 for study.
- C. M. Jansky, associate professor of electrical engineering, without salary from October 16, 1928 to June 30, 1929, to prepare material and data for presentation before the Federal Radio Commission.
- John C. McKinley, associate professor of medicine, sabbatical furlough from September 16, 1928 to September 15, 1929.

- Dwight E. Minnich, associate professor of zoology, sabbatical furlough for 1928-29 to accept a Guggenheim fellowship.
- Joseph Valasek, associate professor of physics, sabbatical furlough for 1928-29 for study in X-ray work at the University of Upsala, Sweden.
- Warren C. Waite, associate professor of agricultural economics, without salary from October 1, 1928 to July 1, 1930, for work with United States Bureau of Economics.
- Marion Weller, associate professor of home economics, sabbatical furlough from April 16 to June 30, 1929 in the preparation of a book in Washington, D. C.
- J. P. Wentling, associate professor of forestry, without salary for 1928-29 to accept position as director of Western Red Cedar Association.
- Carle C. Zimmerman, associate professor, Agricultural Experiment Station, without salary June 16 to 30, 1929.
- William L. Cavert, assistant professor of agricultural extension, sabbatical furlough from September 16, 1928 to June 30, 1929 for graduate study at Cornell University.
- Alice M. Child, assistant professor of home economics, sabbatical furlough from March 23 to June 15, 1929, to work with Food Research Group of the United States Department of Agriculture.
- Ralph L. Dowdell, assistant professor in School of Mines and Metallurgy, without salary for the spring quarter of 1928-29 and for the year 1929-30.
- Helen W. Hazelton, assistant professor of physical education for women, without salary for 1928-29 to study for Master's degree at Teachers College.
- James T. Hillhouse, assistant professor of English, sabbatical furlough for 1928-29 for travel and research work in Europe.
- Arthur H. Larson, assistant professor, Northwest School and Station, sabbatical furlough from September 1, 1928 to August 31, 1929 for study towards a Master's degree.
- Amy P. Morse, assistant professor of home economics, sabbatical furlough for 1928-29, half of year for study at Columbia University for Master's degree and the other half for travel in Europe.
- Wayne L. Morse, assistant professor in Department of Speech, without salary for 1928-29 for work at Columbia University.

- Harry J. Ostlund, assistant professor in School of Business Administration, without salary from January 1 to June 30, 1929, for cost research work for National Wholesale Druggists Association.
- Ethel Phelps, assistant professor of home economics, with salary from December 14, 1928 to January 29, 1929, on account of illness.
- Gertrude Reeves, assistant professor of music, sabbatical furlough for 1928-29 for study in London and Leipzig.
- Arthur A. Zierold, assistant professor of surgery, without salary from July 1, 1928 to March 31, 1929 for travel abroad.
- Frederick J. Alway, professor and chief of the Division of Soils, with salary from June 10 to 30, 1929, to visit agricultural experiment stations in Germany, Holland, France, Switzerland, and England.
- Frank E. Burch, professor and head of the Department of Ophthalmology and Oto-Laryngology, without salary from July 17 to September 30, 1929 for travel abroad.
- William H. Emmons, professor of geology and mineralogy, without salary from November 19 to 30, 1929, to study copper deposits in Michigan for Calumet and Hecla Consolidated Copper Company.
- Donald N. Ferguson, professor of music, sabbatical furlough for 1929-30 for study in Europe.
- Frederick Klaeber, professor of comparative philology, sabbatical furlough for 1929-30 for travel abroad.
- August C. Krey, professor of history, without salary, for winter and spring quarters of 1929-30 to continue work in social science studies.
- Frederick M. Mann, professor of architecture, sabbatical furlough from April 1 to September 30, 1930, for travel abroad.
- Wyle B. McNeal, professor and head of the Department of Home Economics, sabbatical furlough from July 1, 1929 to May 31, 1930, for travel abroad.
- Richard R. Price, professor and director of the General Extension Division, sabbatical furlough from August 1, 1929 to June 30, 1930, for travel in Europe, observing methods, practices, and administration of adult education.
- Harold S. Quigley, professor of political science, sabbatical furlough from January 1 to March 31, 1930 for travel in Japan.

- Frank B. Rowley, professor and director of Experimental Engineering Laboratories, without salary for 1929-30 to accept position as manager of technical department of Insulite Company of Minneapolis.
- S. Carl Shipley, professor of mechanical engineering, without salary for 1929-30 to accept position as engineer with Minneapolis-Honeywell Company.
- David F. Swenson, professor of philosophy, sabbatical furlough for 1929-30 for travel.
- Charles P. Sigerfoos, professor of zoology, sabbatical furlough for 1929-30 for travel in Far East.
- Elmer E. Stoll, professor of English, sabbatical furlough for 1929-30 for travel and study in Europe.
- E. H. Sutherland, professor of sociology, without salary for 1929-30 to do research work for the Bureau of Social Hygiene.
- Wallace H. Cole, associate professor of surgery, without salary from July 1 to August 31, 1929.
- George H. Montillon, associate professor of chemistry, sabbatical furlough for 1929-30 for graduate study and research.
- George A. Pond, associate professor of farm management, with salary, from August 26 to September 7, 1929, to attend International Conference on Agricultural Economics at Dartington Hall, Totnes Devon, England.
- Frederick C. Rodda, associate professor of pediatrics, without salary June 1-30, 1930.
- William A. Roll, associate professor of dentistry, without salary for 1929-30 on account of illness.
- Clare L. Rotzel, associate professor, General Extension Division, without salary, from February 1 to June 30, 1930.
- William W. Swanson, associate professor of pediatrics, sabbatical furlough for 1929-30 for research and study at Johns Hopkins University.
- Anthony L. Underhill, associate professor of mathematics, with salary, from April 1 to June 30, 1930, for travel and study abroad (leave on full pay in lieu of reduced Summer Session pay).
- Elizabeth Atkins, assistant professor of English, with salary, from October 23 to November 9, 1929, on account of illness.

- Gertrude M. Baker, assistant professor of physical education for women, sabbatical furlough for 1929-30 for rest and study.
- Roy O. Bridgford, assistant professor, West Central School and Station, (Morris), sabbatical furlough from September 1, 1929 to August 31, 1930, for graduate work at the University of Minnesota.
- Muriel B. Carr, assistant professor of English, sabbatical furlough for 1929-30 for study, research, and writing in Europe.
- Jonas J. Christensen, assistant professor of plant pathology and botany, sabbatical furlough from October 1, 1929 to September 30, 1930, to accept a Guggenheim fellowship.
- Raymond H. Herrmann, assistant professor of mathematics and mechanics, without salary for 1929-30, for preparation of a book.
- Dorothy S. Kurtzman, superintendent of nurses and assistant professor, sabbatical furlough from March 1 to July 31, 1930 for study at Teachers College, Columbia University.
- Roger S. Mackintosh, exhibit specialist with the rank of assistant professor in the Division of Agricultural Extension, with salary from March 3 to April 22, 1929, on account of illness.
- Thomas M. McCall, assistant professor, Northwest School and Station (Crookston), sabbatical furlough from September 1, 1929 to August 31, 1930, half time for graduate work towards a Master's degree and one-half time as a research fellow at Iowa State Agricultural College.
- Paul R. McMiller, assistant professor of soils, without salary, from August 16 to September 15, 1929, and June 16 to September 30, 1930, to have charge of soils work in connection with the Land and Economic Survey.
- George A. Montelius, assistant professor of dentistry, without salary, for winter and spring quarters of 1929-30 for work in Peking Union Medical School.
- Abe Pepinsky, assistant professor of public school music, sabbatical furlough for 1929-30 for study in Europe.
- Frederick L. Pfeiffer, assistant professor of German, without salary for fall and winter quarters of 1929-30 on account of illness in his family.
- Julius Romness, assistant professor of agricultural engineering, without salary, from July 1 to August 31, 1929.

- Arthur J. Schwantes, assistant professor of agricultural engineering, sabbatical furlough from March 7 to June 7, 1930, for graduate study at the University of Wisconsin.
- Lawrence D. Steefel, assistant professor of history, sabbatical furlough for 1929-30 for travel and study in Europe.
- Nelson W. Taylor, assistant professor of chemistry, without salary, for 1929-30 to accept a Guggenheim fellowship for study abroad.

PROMOTIONS EFFECTIVE WITH YEAR 1928-29

Associate Professor to Professor—

- Raymond Brink (College of Science, Literature, and the Arts)
 Oscar Burkhard (College of Science, Literature, and the Arts)
 P. A. O'Leary (Mayo Foundation)
 Henry E. Michelson (Medical School)
 Robert D. Mussey (Mayo Foundation)
 Charles H. Rogers (College of Pharmacy)
 J. Warren Stehman (School of Business Administration)
 John J. Willaman (College of Agriculture)

Professorial Lecturer to Professor—

- Jerry E. Wodsedalek (College of Science, Literature, and the Arts)

Assistant Professor to Associate Professor—

- Carlos V. Arjona (College of Science, Literature, and the Arts)
 Charles Bird (College of Science, Literature, and the Arts)
 Louis A. Buie (Mayo Foundation)
 John N. D. Bush (College of Science, Literature, and the Arts)
 George P. Conger (College of Science, Literature, and the Arts)
 Josephine Foster (Institute of Child Welfare)
 William H. Goeckermann (Mayo Foundation)
 Florence L. Goodenough (Institute of Child Welfare)
 Edna Heidbreder (College of Science, Literature, and the Arts)
 Louis S. Heilig (School of Mines and Metallurgy)
 Julian G. Leach (College of Agriculture)
 Lee I. Smith (School of Chemistry)

George Stephenson (College of Science, Literature, and the Arts)

William W. Swanson (Medical School)

George A. Thiel (College of Science, Literature, and the Arts)

Hugh B. Wilcox (Engineering and Architecture)

Carle C. Zimmerman (College of Agriculture)

Instructor to Assistant Professor—

Elizabeth Atkins (College of Science, Literature, and the Arts)

August B. Black (College of Agriculture)

Orwood J. Campbell (Medical School)

Elizabeth Carlson (College of Science, Literature, and the Arts)

Charles E. Connor (Medical School)

Arthur U. Desjardins (Mayo Foundation)

George R. Dunn (Medical School)

Marion L. Faegre (Institute of Child Welfare)

Walter A. Fansler (Medical School)

C. Alford Fjelstad (Medical School)

Halvor A. Halvorson (Medical School)

Edwin A. Hanson (College of Agriculture)

Alfred L. Harvey (College of Agriculture)

Peder L. Johnsrud (College of Agriculture)

E. Mendelssohn Jones (Medical School)

Hugh T. Jones (Mayo Foundation)

Grayson N. Kefauver (College of Education)

John S. Lundy (Mayo Foundation)

Frank S. McKinney (Medical School)

Herman J. Moersch (Mayo Foundation)

Elizabeth Nissen (College of Science, Literature, and the Arts)

Arnold E. Osterberg (Mayo Foundation)

Erling S. Platou (Medical School)

M. Lois Reid (College of Agriculture)

Harlow C. Richardson (College of Science, Literature, and the Arts)

Emil C. Robitshek (Medical School)

Herbert Sorenson (General Extension Division)

August L. Strand (College of Agriculture)

William H. von Lackum (Mayo Foundation)

Robert Weidenhammer (School of Business Administration)
 Anton G. Wethall (Medical School)
 Herbert H. N. Wynne (Medical School)
 Thomas Ziskin (Medical School)

Lecturer to Assistant Professor—

Lennox Mills (College of Science, Literature, and the Arts)

PROMOTIONS EFFECTIVE WITH YEAR 1929-30

Acting Dean to Dean—

William F. Lasby (College of Dentistry)

Associate Professor to Professor—

Francis B. Barton (College of Science, Literature, and the Arts)

William S. Cooper (College of Science, Literature, and the Arts)

Harold S. Diehl (Preventive Medicine and Public Health)

Robert G. Green (Medical School)

Robert T. Jones (College of Engineering and Architecture)

J. Charnley McKinley (Medical School)

Louallen F. Miller (College of Science, Literature, and the Arts)

Dwight Minnich (College of Science, Literature, and the Arts)

George C. Priester (College of Engineering and Architecture)

Harry B. Roe (College of Agriculture)

Edward H. Sirich (College of Science, Literature, and the Arts)

William D. Vehe (College of Dentistry)

Malcolm Willey (College of Science, Literature, and the Arts)

Assistant Professor to Associate Professor—

J. William Buchta (College of Science, Literature, and the Arts)

George O. Burr (College of Science, Literature, and the Arts)

Alice M. Child (College of Agriculture)

Wallace H. Cole (Medical School)

Ross Finney (General Extension Division)

Earl B. Fischer (College of Pharmacy)

John W. Gruner (College of Science, Literature, and the Arts)

Gertrude Hull (College of Science, Literature, and the Arts)
 Frederick B. Hutt (College of Agriculture)
 Jane M. Leichsenring (College of Agriculture)
 Walter I. Lillie (Mayo Foundation)
 George Lussky (College of Science, Literature, and the Arts)
 Harold Macy (College of Agriculture)
 George T. McDowell (College of Science, Literature, and the Arts)
 Ralph E. Montonna (School of Chemistry)
 William A. O'Brien (University Hospital)
 William E. Peterson (College of Agriculture)
 Adolph Ringoen (College of Science, Literature, and the Arts)
 Rhodes Robertson (School of Architecture)
 George M. Schwartz (College of Science, Literature, and the Arts)
 Harold R. Searles (College of Agriculture)

Principal to Principal and Associate Professor—

Charles W. Boardman (University High School)

Professorial Lecturer to Associate Professor—

Theodore Blegen (College of Science, Literature, and the Arts)

Instructor to Assistant Professor—

Raymond W. Allard (School of Mines and Metallurgy)
 Carl M. Anderson (Mayo Foundation)
 Raymond N. Bieter (Medical School)
 H. H. Bowing (Mayo Foundation)
 Harold D. Caylor (Mayo Foundation)
 John O. Christianson (School of Agriculture)
 Winchell McK. Craig (Mayo Foundation)
 Ralph Dawson (College of Science, Literature, and the Arts)
 Harry A. Doeringsfeld (College of Engineering and Architecture)
 Alvin C. Eurich (College of Education)
 F. A. Figi (Mayo Foundation)
 Ralph K. Ghormley (Mayo Foundation)
 Roy H. Giberson (College of Agriculture)
 F. Lincoln Holmes (College of Science, Literature, and the Arts)

Kano Ikeda (Medical School)
 Blanche Kendall (College of Science, Literature, and the Arts)
 James W. Kernohan (Mayo Foundation)
 Joseph T. King (Medical School)
 Ralph T. Knight (University Hospital)
 Lester C. McCarthy (College of Dentistry)
 Forrest E. Miller (College of Engineering and Architecture)
 Frederick P. Moersch (Mayo Foundation)
 Ernest S. Osgood (College of Science, Literature, and the Arts)
 Truman A. Pascoe (Medical School)
 Herman A. Rodenhiser (College of Agriculture)
 Raymond C. Rose (College of Agriculture)
 William J. Routledge (College of Science, Literature, and the Arts)
 William M. Sandstrom (College of Agriculture)
 Mary Shirley (Institute of Child Welfare)
 Edward Staadt (College of Science, Literature, and the Arts)
 W. B. Stark (Mayo Foundation)
 Clyde Stephens (College of Science, Literature, and the Arts)
 Claude N. Stokes (University High School)
 Alice Felt Tyler (College of Science, Literature, and the Arts)
 Arthur N. Wilcox (College of Agriculture)

Professorial Lecturer to Assistant Professor—

Wesley E. Peik (College of Education)

*Professor of Zoology (College of Science, Literature, and the Arts)
to Professor of Anatomy (Medical School)—*

Hal Downey

RESIGNATIONS, 1928-29

Fred L. Adair, professor of obstetrics and gynecology, effective July 1, 1929.
 Edward M. Johnson, professor of journalism, effective at close of 1928-29.
 Leonard V. Koos, professor of secondary education, effective at close of 1928-29.
 Major Bernard Lentz, professor of military science and tactics and commandant, effective September 15, 1929.

- Ruth S. Phelps, professor of Romance languages, effective January 1, 1929.
- H. Bruce Price, professor of farm management and agricultural economics, effective May 1, 1929.
- F. Denton White, professorial lecturer in College of Dentistry, effective at close of 1928-29.
- John J. Willaman, professor of agricultural biochemistry, effective April 1, 1929.
- Cyril M. Jansky, associate professor of electrical engineering, effective at close of 1928-29.
- Raymond E. Kirk, associate professor of inorganic chemistry, effective at close of 1928-29.
- Frank W. Lathrop, associate professor of agricultural education, effective at close of first term of 1929 Summer Session.
- William Lerche, associate professor of surgery, effective January 1, 1929.
- Robert W. Murchie, associate professor of sociology, effective July 1, 1929.
- Earl A. Stewart, associate professor of agricultural engineering, effective November 21, 1928.
- John P. Wentling, associate professor of forestry, effective at close of 1928-29.
- Captain Nyal L. Adams, assistant professor of military science and tactics, effective at close of 1928-29.
- Albert G. Black, assistant professor of farm management and agricultural economics, effective July 21, 1929.
- Clarence E. Cary, assistant professor of horticulture, effective September 1, 1928.
- Katherine Dougherty, assistant professor in School of Nursing, effective June 16, 1929.
- Mrs. Mabelle Sperry Ehlers, assistant professor and assistant dining hall manager, effective at close of 1928-29.
- Major Ray C. Hill, assistant professor of military science and tactics, effective at close of 1928-29.
- Gustav O. Hoglund, assistant professor of mechanical engineering, effective at close of 1928-29.
- Grayson Kefauver, assistant professor of secondary education, effective at close of 1928-29.

- Delmar H. LaVoi, assistant professor of animal husbandry at the Northwest School and Station, effective October 1, 1929.
- Mark A. McCarty, assistant professor of animal husbandry, effective October 1, 1929.
- Katharine McFarland, assistant professor and manager of dining hall, effective September 1, 1928.
- Paul Morand, assistant professor of Romance languages, effective November 16, 1928.
- Wayne L. Morse, assistant professor of speech, effective at close of 1928-29.
- Mildred D. Mudgett, assistant professor of sociology, effective at close of 1928-29.
- Willard C. Olson, assistant professor of educational psychology, effective at close of 1928-29.
- Captain Wilton B. Persons, assistant professor of military science and tactics, effective at close of 1928-29.
- Margaret Warwick, assistant professor of pathology, effective November 1, 1928.

RESIGNATIONS, 1929-30

- Royal N. Chapman, professor of entomology and economic zoology and chief of the Division of Entomology and Economic Zoology, effective at close of 1929-30.
- Edward U. Condon, professor of physics, effective at close of 1929-30.
- Oscar E. Harder, professor of metallography, effective September 1, 1930.
- Earl Hudelson, professor of education, effective at close of 1929-30.
- Ralph G. Mills, professor of pathology, Mayo Foundation, effective January 1, 1930.
- Richard E. Scammon, professor of anatomy, effective at close of first term of 1930 Summer Session.
- Frederic W. Schlutz, professor of pediatrics and head of the Department of Pediatrics, effective April 1, 1930.
- S. Carl Shipley, professor of mechanical engineering and superintendent of shops, effective at close of 1929-30.
- Pitirim A. Sorokin, professor of sociology, effective at close of 1929-30.

- Clarence W. Spears, professor of physical education for men, and head football coach, effective February 16, 1930.
- Arthur C. Strachauer as director of the Cancer Institute and head of the Department of Surgery, effective July 1, 1930 (to retain his position as professor of surgery without salary).
- Edwin H. Sutherland, professor of sociology, effective at close of 1929-30.
- George A. Lundberg, associate professor of sociology, effective at close of 1929-30.
- William A. Roll, associate professor of dentistry, effective at close of 1929-30.
- William W. Swanson, associate professor of pediatrics, effective July 1, 1930.
- Marion L. Vannier, associate professor and director of the School of Nursing, effective September 16, 1930.
- Bessie Baker, assistant professor of nursing, effective February 14, 1930.
- Helen D. Bragdon, assistant professor of educational psychology, effective at close of 1929-30.
- Harvey E. Brewbaker, assistant professor of agronomy and plant genetics, effective July 1, 1930.
- Lieutenant John F. Cassidy, assistant professor of military science and tactics, effective at close of 1929-30.
- Arthur L. Delez, assistant professor of veterinary medicine, effective at close of 1929-30.
- Major Earl L. Hering, assistant professor of military science and tactics, effective January 1, 1930.
- Raymond R. Herrmann, assistant professor of mathematics and mechanics, effective at close of 1929-30.
- Earl A. Hewitt, assistant professor of veterinary medicine, effective September 1, 1929.
- Maynard S. Johnson, assistant professor of entomology and economic zoology, effective July 1, 1930.
- Frederick S. Matthews, assistant professor of military science and tactics, effective at close of 1929-30.
- Amy P. Morse, assistant professor of home economics, effective at close of 1929-30.
- Truman A. Pascoe, assistant professor of physiology, effective January 1, 1930.

Stanley H. Perry, assistant professor of history, General Extension Division, effective July 1, 1930.

Frederick L. Pfeiffer, assistant professor of German, effective April 1, 1930.

Captain Don F. Pratt, assistant professor of military science and tactics, effective at close of 1929-30.

Frederick J. Stevenson, assistant professor of plant genetics, effective August 16, 1930.

E. Marion Wade, assistant professor of preventive medicine and public health, effective January 1, 1930.

Daniel E. Ziskin, assistant professor of dentistry, effective April 1, 1930.

RETIREMENT

*Henry J. Fletcher, professor of law, retired at close of 1928-29.

*Gisle Bothne, professor of Scandinavian languages, retired at close of 1928-29.

*Thomas G. Lee, professor of anatomy, Medical School, retired at close of 1928-29.

*Charles P. Sigerfoos, professor of zoology, effective at close of 1929-30.

IN MEMORIAM

The University suffered great loss by the death of the following:

WILLIAM WATTS FOLWELL

President-Emeritus

February 14, 1833—September 18, 1929

No president of the University of Minnesota can chronicle in cold type the feeling of the university group in connection with the passing from our scene of William Watts Folwell. His ripe and amazingly stimulating personality had been a large and helpful part of our lives for so many years that few of us ever had contemplated the possibility of the University of Minnesota without Dr. Folwell a physical part of the campus community.

Nothing that can be said here will add to the stature of the man universally recognized as Minnesota's first citizen. We have been blest and benefited by his life, and we as individuals and as an institution will feel for years to come the challenge of the standards which he set for us. The following resolutions were adopted by the University Senate:

Dr. Folwell was a native of Seneca County, New York. His boyhood was spent in working on the family farm and in attending school; his youth in teaching school

* Given rank of professor emeritus.

and attending academy. He was graduated from Hobart College in 1857 and received the degree of M.A. from the same institution in 1860. The degree of LL.D. was conferred upon him by Racine College in 1870 and by Hobart in 1878.

After graduation he served two years on the faculty of his Alma Mater, teaching mathematics and foreign languages. Becoming interested in Comparative Philology, he matriculated at the University of Berlin in 1861 to prepare himself in this field. He returned to fight for the Union and was commissioned first lieutenant in the Fiftieth New York Regiment of Volunteers. He rose to the rank of Brevet Lieutenant-Colonel of Engineers, the highest rank possible in this branch of the service at that period. Dr. Folwell spoke rarely and with extreme modesty of his military service to his country, but he felt a justifiable pride in it. It is known that he suffered privation and was on occasion, in his line of duty, exposed to grave personal danger. He served from 1862 to 1865.

At the conclusion of the war he became one of the managers of an extensive business enterprise in Ohio, one of the activities of which embraced co-operative milling. It was during this period that he devoted close study to economics and politics, the subjects which in after years became his chosen field of teaching.

In 1869 he had but just accepted a professorship in mathematics and engineering at Kenyon College, Ohio, when he was called to the University of Minnesota and became its first president. He found here one building, a faculty of eight instructors and fourteen students, the majority of whom were in the preparatory department.

The institution and the state owe him much for his pioneer work and in this he displayed truly marvelous vision. In his inaugural address he argued that the state should provide liberally for the University and should set the million for her unit. He advocated the establishment by the state of free, public High Schools, articulated with the University. By 1890 these had developed so satisfactorily that the institution was able to dispense with its preparatory department. It was he who proposed the plan of establishing Junior Colleges years before the educational world was able to conceive the possibility of such a system. In 1880 he proposed a ten-year building plan to provide for the material expansion of this institution. A geological and natural history survey of the state was suggested by him and it was he who drafted the bill, passed in 1872, providing for such a survey. Foreseeing the great expansion of the University, as early as 1881 he suggested to the Regents that a new site in the vicinity of Minnetonka be purchased.

On his arrival here he found the agricultural instruction too academic in character to meet the needs of the state. He advised that instruction by lectures and demonstration, without prerequisites, be offered in all agricultural courses. On these lines the farmer's lecture courses and the School of Agriculture were established.

In 1882 President Folwell inaugurated an extension service by causing the establishment in the College of Engineering of an artisan's training school and also an evening course in industrial drawing for mechanics.

His prominence as civic leader is testified by the positions he held at various periods: Commissioner to the Centennial Exhibition 1876; President of the Minneapolis Society of Fine Arts 1882-1892; Member of the Board of Park Commissioners and its President 1894-1901; Chairman of the State Board of Charities and Corrections 1895-1901; President of the Minneapolis Improvement League 1902-1905. He was also acting president of the American Economic Association in 1892, President of the Minnesota Historical Society 1924-1927 and a member of Phi Beta Kappa.

Far-reaching as was his influence in the presidency of the University, it is indubitable that he was happier as scholar, teacher, and writer than as an administrator. He resigned the presidency in 1883 and was elected to the chair of Political Science where he taught until his retirement in 1907. Lucidity, practicality and a conservatism strangely contrasting with his educational vision, characterized his teaching in this field. He served, too, until 1902, as Librarian of the University in which office he took an advisory rather than active part.

From the time of his retirement until his death his main interest centered in the writing of the four volumes of his History of Minnesota. Sound scholarship, fearlessness and unbiased judgment are outstanding qualities of the work. His personal ac-

quaintance with most of the chief actors in the State's history lends to many an episode the vividness of life. The work is marked by notable distinction of style.

It is but simple truth to say that the period from his retirement until a year before his death was one of the happiest of his long life. In the enjoyment of almost perfect health, honored and esteemed, absorbed in his literary work, he scarcely noted the years which seemed to pass him by unscathed. In 1919 the Regents, in honor of the fiftieth anniversary of his inauguration, voted Dr. Folwell the title of President Emeritus. The only instance of the granting of the honorary degree of LL.D. by the University of Minnesota occurred at the Commencement exercises of June, 1925. On this occasion the degree was conferred upon Dr. Folwell. The citation pronounced by the President of the University may stand as a concise but adequate expression of the feeling of the Institution and of the community at large. "Dr. Folwell we respect you for what you are; we honor you for what you have accomplished; we love you for the ideals you have maintained."

For little short of three score years the Campus of our University has seen that trim, alert figure pass briskly by. We shall see him no more but Folwell Hall stands a noble monument to his memory and in its entrance hall, on a tablet of bronze placed as a tribute of appreciation by the General Alumni Association of the University of Minnesota, we read:

"Dr. Folwell organized the University upon lines broad and far-reaching. He guided it through the pioneer period when the struggle was for bare existence. His work has left his ineffaceable impress upon the institution which he served so well for thirty-eight years. His record shows him to have been indeed, a Faithful Servant of the Public."

With the departure of that courteous gentleman, versatile scholar and genial friend, there passes away as well a living memory of sixty years of our Institution's history.

WILLIAM HENRY EUSTIS

University Benefactor

July 17, 1845—November 29, 1928

William Henry Eustis was a friend of the University in a unique and unusual way, as part of a larger program of personal usefulness which marked him as a friend of his fellow men.

At the time of the dedication of the Eustis Wing of the University Hospital, on November 10, 1928, the Board of Regents of the University of Minnesota formally cited Mr. Eustis as a "great benefactor." Its action read as follows:

The University of Minnesota through its Board of Regents hereby publicly cites William Henry Eustis as a true friend of his fellow-men and lauds him as Benefactorem in Excelsis.

Mr. Eustis' name will be preserved in daily service to the children of the State of Minnesota who are the beneficiaries of his great gift to the University—the Minnesota Hospital and Home for Crippled Children. The hospital will remain on the campus as an enduring monument to his generosity and idealism.

J. ARTHUR HARRIS

Professor and Head of Department of Botany

1880-1930

The University lost one of its most distinguished scientists in the death of Dr. J. Arthur Harris on April 24, 1930. His services to the University have been little less than remarkable. He strengthened the organization of

the Department of Botany, added to its materials and equipment for research, built up its herbaria until it had become in certain fields one of the most distinguished in America, and stimulated everyone with whom he came in contact to do pioneer work with a view to discovering new knowledge. Cosmopolitan in his scientific interests, learned in many fields, an indefatigable and great scientist himself, his loss is beyond repair. The following resolutions were adopted by the University Senate:

J. Arthur Harris, a native of Athens County, Ohio, received his B.A. degree in 1901 and that of M.A. the following year from the University of Kansas. The degree of Ph.D. was conferred upon him in 1903 by Washington University, St. Louis, where he served as instructor of botany, 1903-1907. He was botanical investigator of the Station for Experimental Evolution, Carnegie Institution, 1907-24, and head of the Department of Botany, University of Minnesota since 1924.

He was author of *Biometric Study of Basal Metabolism* (in collaboration with F. G. Benedict) and contributed numerous technical papers on botany, zoology, and biological statistics to scientific journals.

His associates in science at this University who are best qualified to judge, speak thus of his scientific attainments:

"A distinguished student of Karl Pearson, he was a pioneer in the introduction of the biometric method in the domain of botany and in biological science in general. His accomplishments in this field included both the application of quantitative methods to the study of living things and also fundamental contributions to the logic and theory of his scientific method. In recognition of these attainments, he received in 1921 the Weldon Medal and Memorial Prize of the University of Oxford, the highest award of merit in this field of science.

"The laurels which he earned in the field of biometry would have sufficed for most men, but not for him. In the field of ecology he blazed new trails, brought in new conceptions, new quantitative technic and adapted the studies of the newer science of physical chemistry to his field studies in plant geography. He believed in studying plants in their own environment and he carried his paths through the morasses of the Dismal Swamp and the Everglades, through the mountain rimmed forests of Jamaica and Hawaii and through the deserts of Jamaica, Arizona and Utah. He bore personally much of the expense of such field studies and the advancement of science was the only reward he desired."

Mr. Harris, in his comparatively short connection with this University, won the respect, admiration and love not only of his colleagues in science, for his accomplishment in his chosen fields and for the courtesy, sympathy, and ability which he displayed in the handling of his department, but also of many others engaged in far different lines of work, for his interests were broad and he was quick to express his appreciation of that which he found excellent in the work of others.

It was this catholicity of interest, doubtless, which gave to some of his utterances and writings that ease, breadth, and philosophic tone which is often associated with the writings of eminent British men of science.

The University of Minnesota indeed grieves at the loss of such a personality. It grieves, too, at the loss of that prestige which his presence conferred.

DEXTER D. MAYNE

1863-1929

Dexter D. Mayme, who has served as principal of the Central School of Agriculture since 1903, died December 14, 1929.

For loyalty to his school, interest in his students, and genuine devotion to his work, no one on the staff of the University of Minnesota rated higher than Mr. Mayne. He was not an idealist merely; he was a practical school-master also. Long before the scientists in education began talking about

objectives, Mr. Mayne had arranged programs of instruction, definite and specific in character, with a view to training young men and young women for life on the farm. These programs laid a basis for understanding and appreciating rural life and improving the economic situation of the farmer and his wife. The success which attended Mr. Mayne's work is attested by the respect and esteem that thousands of graduates and former students of the School of Agriculture bear for him. It is not that respect which comes from fear, nor that affection which is based upon mere sentiment; it is that respect and that affection based upon rugged character, constancy of purpose, diligent devotion to a task, faithfulness to a program, and an unremitting interest in his academic children.

ELWIN BIRD JOHNSON

1865-1928

Mr. Johnson was, as a child, brought from Pennsylvania, the state of his birth, to Minnesota. He was graduated from the College of Science, Literature, and the Arts of the University of Minnesota in 1888. In 1889 he became registrar of the institution and held this position until 1905. From 1906 to 1920 he was secretary of the General Alumni Association, after which he entered business life.

While registrar he founded, in 1901, the *Alumni Weekly*, which, upon being elected Secretary of the Alumni Association, he turned over to that body. The Association has expressed its appreciation of the pioneer work which he did so well as its secretary.

The University Senate formulates this memorial in recognition of the efficient work of Mr. Johnson as registrar of the University and as a mark of its appreciation of his devoted and sincere interest in the welfare of the institution and its graduates.

FRANCIS PRESERVED LEAVENWORTH

September 3, 1858—November 12, 1928.

Professor-Emeritus of Astronomy

Mr. Leavenworth was born at Mt. Vernon, Indiana. He was graduated from the University of Indiana in 1880 and some years later received the degree of M.A. from the same institution. In his early years he was connected successively with the Cincinnati Observatory and the McCormick Observatory of the University of Virginia. He was made Director of Haverford College Observatory in 1887, from which position he came to the University of Minnesota in 1892 as assistant professor of Astronomy. In 1897 he was appointed professor of Astronomy, a position he held until his retirement as professor emeritus in 1927.

As a young man Professor Leavenworth became interested in the measurement of double stars. Such work, requiring the utmost accuracy and infinite patience, he carried on for about forty years. This, with the observation of comets and the brightness of variable stars, constitutes his main contribution to science. His tabulations are preserved in the pages of the *Astronomical Journal*.

As a teacher of Astronomy he never was a taskmaster; rather an interpreter of nature, inspiring in others love for the science which meant so much to himself.

He was a member of the Royal Astronomical Society, the American Astronomical Society and the honorary fraternities, Phi Beta Kappa and Sigma Xi.

Mr. Leavenworth was a man of simple tastes, noticeably unassuming demeanor and unflinching good humor. With his friends, and these were many in the faculty and among his former students, his habitual shyness was not in evidence.

In recognition of the value of a sincere life, whole heartedly devoted to science and to teaching, the Senate of the University which Mr. Leavenworth served for thirty-five years has formulated this appreciation.

CARL SCHLENKER

June 8, 1869—November 26, 1928

Professor and Chairman of German Department

Mr. Schlenker was born at Wilkesbarre, Pennsylvania. He was graduated from the University of Michigan in 1892. He studied and taught at the University of Iowa and from there came to this university as instructor in German in 1898. He was made professor in 1905 and chairman of the department in 1914.

Mr. Schlenker will long be remembered by his colleagues as a man of unusually winning personality. There was something in the grasp of his hand and in the kindness of his glance that seemed to win one's heart at the first meeting.

His somewhat artistic temperament, evinced by his knowledge of music and liking for it; his appreciation of the fine things of art and literature; his whimsical humor; above all, his kindness and capacity for sympathy, were personal qualities that helped make his interpretation of the masterpieces of German literature a source of pleasure and inspiration to his students.

He loved his work as a teacher. His reward was the esteem and affection of those he taught. There were those who idolized him.

The University realizes that among its valued assets is the influence upon generations of students of such a teacher as Carl Schlenker.

ARTHUR AMBROSE SWEENEY

1858-1928

Lecturer in Medical School

Dr. Sweeney, born at Aurora, Illinois, received his academic training at Fordham College and Georgetown University. He was graduated from the Medical School of Harvard University in 1880.

Coming to St. Paul, Minnesota, in 1887, he soon took a prominent part in civic activities for he was one of the founders, thirty-eight years ago, of the St. Paul Institute, the potent influence of which upon the cultural life of the city is widely recognized. As its secretary until 1921 and as

its president from that date until 1928 he was largely instrumental in formulating its policies.

Dr. Sweeney was a specialist in nervous and mental diseases and in Medical Jurisprudence. He served as consulting neurologist for several railroads. He was also an authority on immigration and was frequently consulted at the time of the drafting of the present immigration laws. He was often called to court to pass judgment upon mental conditions in criminal cases and to give expert testimony.

He was Secretary of the Minnesota State Board of Medical Examiners from 1889 to 1892. During the World War he served as an alienist in an advisory capacity at Camp Dodge, Iowa.

In 1897 Dr. Sweeney was appointed Professor of Medical Jurisprudence in the Medical School of the University of Minnesota from which position he resigned in 1913. From that date until the time of his death he served as lecturer on Medical Jurisprudence. It may be said with truth that he left his impress upon the practice, literature, and teaching of medicine of his day.

Dr. Sweeney was a man of unusually broad intellectual interests. Science, Literature, Art, Music: all helped to enrich a gifted mind which, with his impressive physique and fine voice flowered in a personality at once dominating and attractive. His unflinching optimism cheered many a patient.

The medical profession, our University and the community at large have suffered in his loss for in addition to his high professional attainments he was one who contributed to the beauty and to the joy of life.

CHAUNCEY J. VALLETTE PETTIBONE

October 19, 1884—March 7, 1929

Associate Professor of Physiology

Mr. Pettibone, born at Fond du Lac, Wisconsin, received his B.S. degree at the University of Chicago. He spent the years 1907-1908 at the Royal Technical High School in Berlin and 1911-12 at the University of Halle. He won his Ph.D. degree at Harvard, 1913.

He came as instructor in Physiological Chemistry to the University of Minnesota in 1912, was made assistant professor in 1917 and associate professor in 1920.

His personal qualities were such that he easily won the confidence of students and this made him of especial value to the University as adviser of pre-medical and freshman medical students.

Mr. Pettibone had received fine training in his specialty, had in addition wide intellectual interests and was a devotee of athletic sports—skating, tennis and gymnastics. He was well known in musical circles of the city, for he was a lover of music, and possessed a voice of considerable power and of unusual sweetness, a never failing source of pleasure to his acquaintances.

A striking characteristic was his exquisite courtesy—a courtesy born of fine sensibility and broad culture. Yet his outlook on life was that of

a realist, and sentimentality seemed foreign to his nature. Many of his students and colleagues had a strong affection for John Pettibone and his going has left with them a sense of poignant grief.

MYRON HERBERT REYNOLDS

November 5, 1865—January 15, 1929

Professor of Veterinary Medicine

Dr. Reynolds, born at Wheaton, Illinois, enjoyed the benefits of a many sided education. He completed a course in agriculture at the Iowa State College in 1886, receiving the degree of B.S. The degree of D.V.M. was conferred upon him by the same institution in 1889. He won his M.D. degree at the Iowa College of Physicians and Surgeons and received that of Ph.G. from the Iowa College of Pharmacy.

Dr. Reynolds first came to Minnesota in 1893 as professor of veterinary medicine in charge of the instruction in that field in the School and College of Agriculture. He was also made a member of the staff of the Minnesota Agricultural Experiment Station. This position he occupied until 1917. Since that time he has served the University as Professor of Veterinary Medicine, teaching classes in both the School and College of Agriculture.

Educated in both the veterinary and medical schools, he was in a position to appreciate the relation of animal diseases to public health and consistently worked for legislation that would safeguard it. In 1903 he was instrumental in the formation of the Minnesota Livestock Sanitary Board and for many years served as a member of the Board.

As a pioneer member of the faculty of the School and College he fostered high standards in education and insisted on a high degree of honor and integrity, both in class work and in social relations. Dr. Reynolds was a frequent contributor to medical journals and attended quite regularly the meetings of his profession with a view to improving the standard of work and the character of the contributions published in the interests of public health. He had a wide acquaintance with the livestock men of the state whose friendship he retained notwithstanding occasional differences of opinion.

FREDERICK COURTLAND WAGNER

June 23, 1887—May 5, 1930

Associate Professor in the School of Business Administration

Frederick Courtland Wagner was born at Port Erie, Ontario. He received his degree of B.S. at Northwestern University in 1914, and his degree of M.A. at Columbia University in 1916. He pursued graduate work in economics and business administration for two years at the University of Chicago. He served as instructor at the University of Chicago for two years and as professor of business administration at the University of South Dakota for four years.

In 1927, Mr. Wagner was appointed associate professor of market administration at the University of Minnesota, a position he held until the time of his death.

His chief contribution to the University consisted in the wide contact, both personal and professional, which he established with merchants of the state. His success in this work was due to his tact, his judgment, and his unquestioned integrity.

Both students and colleagues appreciated his geniality in his relations with them and perhaps above all the quick sympathy with which he generously responded when his counsel was sought. Everyone who knew him recognized his sincerity and the unselfishness with which he gave himself to his work.

In addition to the above the following deaths occurred:

Oscar W. Peterson, instructor in music at the Northwest School and Station (Crookston), January 11, 1929.

Maurice G. Jacobson, instructor in agricultural engineering, June 20, 1929.

Charles Stanley McVicar, assistant professor, Mayo Foundation, June 29, 1929.

Grace E. Denny, instructor in physical education for women, September 26, 1929.

William O. Beal, assistant professor of astronomy, February 15, 1930.

BUILDINGS AND GROUNDS

BUILDINGS AND GROUNDS

LAND AND BUILDINGS

LAND

During the past two years additions to the main campus were made by the purchase of the following properties :

The George P. Gould property at corner of Fulton and Essex Streets S.E. consisting of lots 120 x 132, 40 x 45, 132 x 165.

The St. Anthony Holding Company property at Sixteenth Ave. S.E. and Northern Pacific tracks consisting of a 130 x 165 foot lot.

The Louis Andersch property, 1617-1623 Fourth Street S.E. consisting of a 77 x 160 foot lot, and two houses.

The Blaine B. Bates property at 417 Seventeenth Ave. S.E. consisting of a 35 x 132 foot lot, and house.

The Jennie M. Bates property at 421 Seventeenth Ave. S.E. consisting of a 46.5 x 66 foot lot, and house.

The Vern Grass property at 1627-29 Fourth Street S.E. consisting of a 61 x 165 foot lot, and house.

The Leslie C. Lane property at 1601-03 Fourth Street S.E. consisting of a 71 x 100 foot lot, and house.

The Orville T. Lawson property at 1613 Fourth Street S.E. consisting of a 33 x 165 foot lot, and house.

The Albert McClintock property at 412-410 Sixteenth Ave. S.E. consisting of a 65 x 71 foot lot, and two houses.

The T. Joseph Olson property at 1618-20 Fifth Street S.E. consisting of a 66 x 130 foot lot, and house.

The George N. Ruhberg property at 1629 Fourth Street S.E. consisting of a 55 x 110 foot lot, and house.

The Hattie M. Mahon-Setre property at 411 Seventeenth Ave. S.E. consisting of a 55 x 66 foot lot, and four-flat building.

The Frank H. Wakerman property at 1615 Fourth Street S.E. consisting of a 33 x 165 foot lot, and house.

The K. G. Knutson property at 425 Seventeenth Ave. S.E. and 1628 Fifth St. S.E. consisting of a 66 x 82.5 foot lot, and two houses.

With the purchase of the Gould property only two other pieces remain to complete the block on which the first two units of the dormitory system for men will be constructed. The other property listed above gives the University new grounds for military drill. Instruction in Folwell Hall will be facilitated by the removal of drill from the present parade grounds and these grounds will be available for building purposes.

LAND IMPROVEMENTS

Many improvements have been made on the main campus during the past two years. The largest single development was the grading and seeding of the Mall in front of the new Cyrus Northrop Memorial Auditorium to Washington Ave. S.E. The old houses south of the new Physics Building, which had been occupied as co-operative cottages and nurses' homes, were removed and the entire area graded and seeded. This has added greatly to the beauty of the campus.

The areas adjacent to the new Auditorium, new Law, new Physics, and Administration buildings have all been beautifully landscaped according to the plans of the landscape architects of the University.

A great deal of grading and landscape work has been done in front of the new University Hospital.

The tennis courts on Seventeenth Avenue were removed and this area converted into a fine lawn. Thirteen new tennis courts have been added on the area south of Washington Avenue and the tennis courts on Northrop Field have been rearranged so that there are now six courts on this area.

With the development of the Mall an entirely new system of sidewalks was installed, all in accordance with the plans of the landscape architects of the University. This work includes a new sidewalk leading from Seventeenth Avenue between Administration and new Physics, past the Cyrus Northrop Memorial Auditorium and continuing to Fifteenth Avenue. Also a new sidewalk in front of the new Physics Building and one in front of the new Library and Chemistry, each extending to Washington Avenue S.E. Cross walks were installed connecting the Physics Building with the Library and also one connecting Main Engineering with the Chemistry Building.

The sidewalk leading from Fourteenth Avenue across the Knoll was raised and widened and the sidewalk on the south side of University Avenue leading from Fourteenth Avenue to the Stadium was raised and relaid.

A new ornamental lighting system was installed on the Mall and extended to the Engineering group and along Church Street beyond the Botany Building. Money has been set aside to extend the lighting system along Pillsbury Drive and the Knoll.

The parking areas back of the School of Business Administra-

tion and the Music buildings have been removed and curbs and driveways installed.

The following paving has been done on the main campus:

The roadway on the east side and also on the west side of the Auditorium; the driveway leading to the rear of the Chemistry Building and to the rear of the Library; Church Street has been paved from Washington Avenue to the south end of the Hospital, and money has been set aside for paving the west side of Fifteenth Avenue.

On the Farm campus a retaining wall was installed back of the Plant Industry Building which has permitted grading down of the large hill back of that building. Money was set aside for an ornamental lighting system for the Farm campus and the same is now being installed. Also, money was set aside for the paving of Buford Avenue from Cleveland east past the stock pavilion.

BUILDINGS AND TUNNELS

During the past two years the following buildings have been completed:

On the main campus the Cyrus Northrop Memorial Auditorium seating 4,880 people complete with the stage and the auditorium garage.

The addition to the Minnesota General Hospital which includes the Students' Health Service, Out-patient Department, and the Eustis Hospital for Crippled Children.

A new radio station at the northeast corner of the University's Recreation Field.

A new concrete smokestack, 225 feet high at the main campus heating plant.

On the Farm campus a new quarantine barn has been constructed and new root cellar for the Department of Horticulture. Also a series of new botany greenhouses and a new shed for storing automobiles and machinery.

Contracts have been let for the construction of the new Physical Education buildings at Morris and Crookston.

At Morris the remodeling of the dining hall building into a dormitory is well under way.

At Duluth a large addition is being made to Institute Hall which will more than double its capacity.

A new deep tunnel has been built from the Administration Building shaft leading west to the river. This tunnel not only provides ventilation for certain heating tunnels but it also carries the sewer into which all the water from the Physics, Library, and Law School buildings, and the new Auditorium flows.

A new tunnel has been constructed as an extension of the tunnel leading to Chemistry and Mines. This tunnel extends to a point about 300 feet south of Washington Avenue, there turns east and extends to the Botany shaft and also to the Hospital shaft.

Money has been set aside for the construction of a new deep tunnel from the Hospital shaft to the new dormitory site.

Money was also set aside for a tunnel and passage way leading from the Botany Building down the hill to the Botany greenhouse.

BUILDING IMPROVEMENTS AND ALTERATIONS

Besides the customary amount of necessary maintenance which includes interior decorating, painting, miscellaneous roof and gutter repairs, steam lines, electrical work, etc., the following major alterations deserve special mention :

Main Campus

The old Law Building has been completely remodeled on the inside providing laboratory quarters for the University High School, offices and a classroom for the Institute of Child Welfare, and four large general classrooms.

The old Physics Building was remodeled on the inside and now houses the Departments of Art Education, Sociology, and Anthropology.

With the removal of the Students' Health Service from the basement of Pillsbury Hall this space was remodeled to house the Department of Journalism and also Student Publications.

Millard Hall is undergoing a general rearrangement since several departments moved into new quarters at the University Hospital.

Money has been set aside for the remodeling of the old amphitheater room in the Psychology Building to provide urgently needed space for research work.

New quarters for the University Band have been completed under the stage of the new Auditorium. These quarters provide

an office for the band director, locker room, library room, and the main practice room. This room is beautifully designed and acoustically treated.

Shevlin cafeteria has been completely remodeled, attractive booths added, a new terrazzo floor and a modern heating system installed.

New and attractive lighting fixtures have been designed for Shevlin Hall and these will make this building much more attractive.

The obsolete lighting fixtures in Folwell Hall have all been replaced with modern, efficient units. This also applies to the Chemistry Building but in the latter case all of the fixtures are of Bakelite so that fumes will not corrode them.

In the Pharmacy Building, the old hand-control elevator was removed and a new modern, electrically controlled elevator was installed. Money has been set aside to provide for a new heating system for this building.

The contract has been awarded for the installation of a new 750-horse power boiler at the heating plant. Instead of using stokers under this boiler it is to be equipped to burn pulverized fuel and a considerable fuel saving is anticipated.

Farm Campus

An automatic sprinkler system has been installed in the Health Service Building making this building fairly safe from fire.

Weatherstripping, which should result in considerable saving in heat, has been installed on all windows in the Home Economics and Veterinary buildings and Dexter Hall.

Two new alternating current generators were added to the Farm campus power plant and contracts have been let for the remodeling of two of the boilers so as to use pulverized fuel.

New lighting fixtures were installed in the agricultural library, and new maple floors were installed in a part of the girls' dormitory.

At Crookston, Robertson Hall has been completely overhauled. All the old plastering was removed and the entire building replastered; new floors were laid throughout, a new roof put on, and the outside painted. This building is now as good as new

CONCLUSION

The detailed reports of the registrar and of the comptroller and the most significant portions of the reports submitted by the deans of the colleges and the heads of other university administrative units are submitted to complete this report.

Respectfully submitted,

L. D. COFFMAN, *President*

REPORT OF THE REGISTRAR

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STATISTICS OF REGISTRATION

Collegiate students.—Table I records by class and by school or college as well as by men and women, the attendance of students of collegiate grade in all courses of study leading to degrees. All of the students in this group with the exception of those listed as unclassified have been required to present for admission evidence of at least the completion of a four-year high school course or its equivalent. The major portion of the group of unclassified students have also met the regular entrance requirements. A small proportion have been admitted on the basis of age and experience as "adult" special students. A comparison of the net grand totals for 1929-30 with those for 1928-29 shows a gain of 164 students, or 0.9 per cent. The total for 1928-29 is 862 more than for the second year (1927-28) of the last biennium, or 5.5 per cent.

A comparison of the totals for the individual colleges shows gains in 1929-30 for every unit except Nursing, Dentistry, Pharmacy, and the first term of the Summer Session. None of these increases or decreases, however, appear to have any particular significance.

Collegiate enrolment by quarters.—Table II records the totals of Table I by quarters, showing the peak load of attendance in the fall quarter. Aside from the Summer Session, the enrolment in the spring quarter is the lightest.

Subcollegiate students.—Table III shows the enrolment in departments which do not require high school graduation for admission. Definite increases are indicated for all of the schools of agriculture. The increase in enrolment in the University High School is due to the addition of the junior high school grades. Approximately half of the increase in enrolment in the group of agricultural short courses is accounted for by the development of the Farmers' Short Course at the Grand Rapids school.

Extension students.—Table IV shows the enrolment of three types of students: those who pursue courses in classrooms under the personal direction of instructors throughout the semester or year; those who are in attendance for limited periods; and those

whose work is conducted through the medium of written directions sent by mail. Distinct increases appear for each of the three groups. The net total enrolment for all extension activities in 1929-30 exceeds that for 1928-29 by 968 individuals—an increase of 10.4 per cent. The increase in 1928-29 over the preceding year was 6.1 per cent.

Summary.—Table V summarizes the totals of Tables I, III, and IV. The net grand totals of 27,283 for 1928-29 and 29,033 for 1929-30 represent the number of individuals, men and women, who received instruction at the hands of members of the university teaching staff during the two years of the biennium.

Table VI summarizes the registration for each year of the biennium by administrative units. Agriculture in this table includes the College of Agriculture, Forestry, and Home Economics, the four schools of agriculture and the agricultural short courses. Medicine includes courses for nurses and medical technicians in addition to the regular medical course. Dentistry includes the course for dental hygienists, and Education includes the University High School. The term "resident-student" as used in this table is meant to distinguish those who were in the day classes in university buildings from those enrolled in evening classes in the Extension Division or who took work by correspondence.

Degrees conferred.—Table VII compares the number of degrees granted during 1929-30 with the number granted in 1928-29. The total number has increased 8.2 per cent. The increase for 1928-29 over that for 1927-28 was 5.9 per cent.

Geographical distribution.—Table VIIIa enumerates the preparatory schools from which freshman students came to the various schools and colleges during the year 1928-29. Corresponding data for 1929-30 are given in Table VIIIb. The proportionate attendance from Minnesota schools dropped from 87.9 per cent for 1927-28 to 83.4 per cent for 1928-29. For the second year (1929-30) of the biennium, the percentage was 83.5. The per cent that came from schools outside the Twin Cities was 44.1 in 1927-28, 48.7 in 1928-29, and 48.3 in 1929-30. Four hundred two students were admitted to the freshman class in 1928-29 from 30 states other than Minnesota, and 13 students from foreign countries. In 1929-30, 423 students from 33 states were admitted as freshmen and 12 from foreign countries.

Advanced standing.—Tables IXa and IXb show the extent of the migration of students from other colleges and universities to the University of Minnesota. During 1928-29, 1,018 students transferred from 220 different institutions. In 1929-30 there were 984 students from 218 institutions. The University has no basis for estimating the number of students who have left Minnesota to attend institutions in other states.

Tables Xa and Xb show the geographical origin of the entire group of collegiate students, exclusive of the Summer Session, by Minnesota counties, by states, and by foreign countries. These tables include the students of the freshman classes counted in Tables VIIIa and VIIIb. Every county in the state was represented each year of the biennium. The smallest number, 2, came from Lake of the Woods and from Mahnomon counties in 1928-29. In 1929-30 the smallest number from any one county was 4 from Lake of the Woods County. The proportion of students from Hennepin and Ramsey counties was 54.5 per cent in 1928-29 and 55.1 per cent in 1929-30. Forty-six states, including the District of Columbia, sent students to the University of Minnesota each year of the biennium. The largest groups from outside Minnesota came from the neighboring states: Wisconsin, North Dakota, South Dakota, and Iowa.

Respectfully submitted,

RODNEY M. WEST, *Registrar*

TABLE I. COLLEGIATE STUDENTS BY SCHOOLS AND COLLEGES,
1928-1930

COLLEGE OR SCHOOL	YEAR 1928-29			YEAR 1929-30			GAIN	LOSS
	Men	Women	Total	Men	Women	Total		
UNASSIGNED .....	.....	.....	.....	14	9	23	23	.....
SCIENCE, LITERATURE, AND THE ARTS:								
Seniors	149	171	320	175	196	371	51	.....
Juniors	233	192	425	193	237	430	5	.....
Sophomores	1,486	875	2,361	1,433	848	2,281	.....	80
Freshmen	1,168	760	1,928	1,166	826	1,992	64	.....
Unclassed	74	120	194	73	117	190	.....	4
Totals	3,110	2,118	5,228	3,040	2,224	5,264	36	.....
ENGINEERING AND ARCHITECTURE:								
Seniors	200	9	209	223	7	230	21	.....
Juniors	236	10	246	292	10	302	56	.....
Sophomores	471	2	473	458	1	459	.....	14
Freshmen	582	.....	582	596	3	599	17	.....
Unclassed	7	9	16	10	1	11	.....	5
Totals	1,496	30	1,526	1,579	22	1,601	75	.....
AGRICULTURE, FORESTRY, AND HOME ECONOMICS:								
Seniors	77	116	193	101	108	209	16	.....
Juniors	78	80	158	78	108	186	28	.....
Sophomores	148	154	302	143	148	291	.....	11
Freshmen	122	99	221	131	124	255	34	.....
Unclassed	24	8	32	23	16	39	7	.....
Totals	449	457	906	476	504	980	74	.....
LAW:								
Third year	75	2	77	75	1	76	.....	1
Second year	74	1	75	78	2	80	5	.....
First year	113	2	115	119	4	123	8	.....
Unclassed	5	.....	5	3	1	4	.....	1
Totals	267	5	272	275	8	283	11	.....
MEDICAL:								
Internes	161	9	170	177	7	184	14	.....
Seniors	104	4	108	97	3	100	.....	8
Juniors	90	3	93	107	6	113	20	.....
Sophomores	143	8	151	134	9	143	.....	8
Freshmen	124	8	132	163	9	172	40	.....
Unclassed	56	5	61	11	.....	11	.....	50
Totals	678	37	715	689	34	723	8	.....
NURSING:								
Third year .....	.....	244	244	.....	221	221	.....	23
Second year .....	.....	164	164	.....	110	110	.....	54
First year .....	.....	182	182	.....	206	206	24	.....
Public Health .....	.....	34	34	.....	38	38	4	.....
Affiliates .....	.....	77	77	.....	75	75	.....	2
Totals .....	.....	701	701	.....	650	650	.....	51

TABLE I—Continued

COLLEGE OR SCHOOL	YEAR 1928-29			YEAR 1929-30			GAIN	LOSS
	Men	Women	Total	Men	Women	Total		
MEDICAL TECHNICIANS....	....	18	18	....	17	17	....	1
DENTISTRY:								
Seniors	100	....	100	104	3	107	7	....
Juniors	96	2	98	85	....	85	....	13
Pre-juniors	80	....	80	80	....	80	....	....
Totals	276	2	278	269	3	272	....	6
DENTAL HYGIENISTS:								
Second year .....	....	20	20	....	27	27	7	....
First year .....	....	26	26	....	27	27	1	....
Unclassed .....	....	8	8	....	2	2	....	6
Totals .....	....	54	54	....	56	56	2	....
MINES AND METALLURGY:								
Seniors	17	....	17	20	....	20	3	....
Juniors	20	....	20	26	....	26	6	....
Sophomores	42	....	42	50	....	50	8	....
Freshmen	56	....	56	61	....	61	5	....
Totals	135	....	135	157	....	157	22	....
PHARMACY:								
Fourth year	32	6	38	40	4	44	6	....
Third year	32	3	35	42	5	47	12	....
Second year	28	5	33	40	5	45	12	....
First year	22	4	26	13	1	14	....	12
Unclassed	21	4	25	2	....	2	....	23
Totals	135	22	157	137	15	152	....	5
CHEMISTRY:								
Seniors	45	....	45	43	1	44	....	5
Juniors	56	....	56	59	1	60	4	....
Sophomores	84	3	87	90	3	93	6	....
Freshmen	118	....	118	118	4	122	4	....
Unclassed	1	1	2	2	....	2	....	....
Totals	304	4	308	312	9	321	13	....
EDUCATION:								
Seniors	99	461	560	127	424	551	....	9
Juniors	123	412	535	104	474	578	43	....
Sophomores	42	128	170	39	107	146	....	24
Freshmen	49	118	167	51	114	165	....	2
Unclassed	78	285	363	98	292	390	27	....
Totals	391	1,404	1,795	419	1,411	1,830	35	....
BUSINESS ADMINISTRATION:								
Seniors	156	23	179	178	27	205	26	....
Juniors	196	31	227	209	44	253	26	....
Unclassed	10	2	12	10	5	15	3	....
Totals	362	56	418	397	76	473	55	....

THE PRESIDENT'S REPORT

TABLE I—Continued

COLLEGE OR SCHOOL	YEAR 1928-29			YEAR 1929-30			GAIN	Loss
	Men	Women	Total	Men	Women	Total		
GRADUATES	976	377	1,353	992	417	1,409	56	....
Total academic year	8,579	5,285	13,864	8,756	5,455	14,211	347	....
Less duplicates...	384	334	718	434	358	792	74	....
Net total academic year	8,195	4,951	13,146	8,322	5,097	13,419	273	....
SUMMER SESSION:								
First term	1,977	3,183	5,160	2,061	2,974	5,035	....	125
Second term	1,136	1,035	2,171	1,171	1,026	2,197	26	....
Totals	3,113	4,218	7,331	3,232	4,000	7,232	....	99
Less duplicates...	792	769	1,561	874	750	1,624	63	....
Net total Summer Session	2,321	3,449	5,770	2,358	3,250	5,608	....	162
MAYO FOUNDATION (Graduate) summer quarter....	258	13	271	246	13	259	....	12
Net total summer enrolment	2,579	3,462	6,041	2,604	3,263	5,867	....	174
Grand totals (collegiate)	10,774	8,413	19,187	10,926	8,360	19,286	99	....
Less duplicates...	1,448	1,026	2,474	1,426	983	2,409	....	65
Net grand totals (collegiate)	9,326	7,387	16,713	9,500	7,377	16,877	164	....

TABLE II. COLLEGIATE ENROLMENT BY QUARTERS, 1928-30

	YEAR 1928-29			YEAR 1929-30		
	Men	Women	Total	Men	Women	Total
Summer Session	2,579	3,462	6,041	2,604	3,263	5,867
Fall quarter	7,418	4,443	11,861	7,547	4,569	12,116
Winter quarter	7,214	4,102	11,316	7,348	4,235	11,583
Spring quarter	6,569	3,927	10,496	6,752	4,027	10,779
Total (individual) registration....	9,326	7,387	16,713	9,500	7,377	16,877

TABLE III. SUBCOLLEGIATE STUDENTS, 1928-30

SCHOOL OR COURSE	YEAR 1928-29			YEAR 1929-30			GAIN	LOSS
	Men	Women	Total	Men	Women	Total		
CENTRAL SCHOOL OF AGRICULTURE:								
Three-year course:								
Seniors	80	19	99	83	16	99	.....	.....
Juniors	91	29	120	90	41	131	11	.....
Freshmen	99	32	131	128	39	167	36	.....
Unclassed	140	40	180	187	37	224	44	.....
Totals	410	120	530	488	133	621	91	.....
NORTHWEST SCHOOL OF AGRICULTURE:								
Three-year course:								
Seniors	37	19	56	43	20	63	7	.....
Juniors	65	22	87	71	28	99	12	.....
Freshmen	92	38	130	97	36	133	3	.....
Unclassed	5	14	19	11	19	30	11	.....
Totals	199	93	292	222	103	325	33	.....
Intermediate	18	9	27	15	13	28	1	.....
Total school regis. .	217	102	319	237	116	353	34	.....
WEST CENTRAL SCHOOL OF AGRICULTURE:								
Three-year course:								
Seniors	39	30	69	59	29	88	19	.....
Juniors	61	26	87	60	32	92	5	.....
Freshmen	92	32	124	115	50	165	41	.....
Unclassed	10	12	22	15	12	27	5	.....
Totals	202	100	302	249	123	372	70	.....
Intermediate	15	7	22	6	10	16	.....	6
Total school regis. .	217	107	324	255	133	388	64	.....
NORTH CENTRAL SCHOOL OF AGRICULTURE:								
Three-year course:								
Seniors	11	.....	11	12	.....	12	1	.....
Juniors	11	.....	11	8	.....	8	.....	3
Freshmen	13	.....	13	22	.....	22	9	.....
Unclassed	7	.....	7	5	.....	5	.....	2
Totals	42	.....	42	47	.....	47	5	.....
Intermediate .....	.....	.....	.....	7	.....	7	7	.....
Total school regis. .	42	.....	42	54	.....	54	12	.....
UNIVERSITY HIGH SCHOOL	156	179	335	187	198	385	50	.....
Grand total schools	1,042	508	1,550	1,221	580	1,801	251	.....
Less duplicates.	1	1	2	.....	.....	.....	.....	2
Net total schools	1,041	507	1,548	1,221	580	1,801	253	.....

TABLE III—Continued

SCHOOL OR COURSE	YEAR 1928-29			YEAR 1929-30			GAIN	LOSS
	Men	Women	Total	Men	Women	Total		
SHORT COURSES:								
Beekeeper's short course	....	.....	.....	7	3	10	10	....
Cowtester's short course (Crookston)	17	.....	17	....	.....	.....	....	17
Creamery operators' short course	61	.....	61	60	.....	60	....	1
Advanced creamery oper- ators' short course....	38	.....	38	28	.....	28	....	10
Farm women's week (Crookston) .....	....	141	141	....	129	129	....	12
Farm women's week (Grand Rapids) .....	....	.....	.....	....	28	28	28	....
Farm women's week (Morris) .....	....	140	140	....	116	116	....	24
Farmers' short course (Grand Rapids)	53	23	76	260	26	286	210	....
Fur breeders' short course	102	11	113	97	9	106	....	7
Ice cream makers' short course	18	.....	18	26	.....	26	8	....
Junior short course (Crookston)	154	134	288	198	178	376	88	....
Junior short course (Grand Rapids)	54	103	157	46	61	107	....	50
Junior short course (Morris)	273	306	579	306	344	650	71	....
Land management short course .....	....	.....	.....	85	1	86	86	....
Milk control officials' short course .....	....	.....	.....	23	.....	23	23	....
Poultry short course...	22	5	27	37	26	63	36	....
Regional scout executive seminar	30	.....	30	34	.....	34	4	....
Scout masters' short course	56	.....	56	32	.....	32	....	24
Grand total short courses	878	863	1,741	1,239	921	2,160	419	....
Less duplicates..	9	1	10	10	3	13	3	....
Net total short courses	869	862	1,731	1,229	918	2,147	416	....
Grand total schools and short courses	1,910	1,369	3,279	2,450	1,498	3,948	669	....
Less duplicates..	46	2	48	51	1	52	4	....
Net total schools and short courses....	1,864	1,367	3,231	2,399	1,497	3,896	665	....

TABLE IV. EXTENSION STUDENTS, 1928-30

	YEAR 1928-29			YEAR 1929-30			GAIN	LOSS
	Men	Women	Total	Men	Women	Total		
GENERAL EXTENSION	3,074	3,249	6,323	3,377	3,508	6,885	562	....
SHORT COURSES:								
Cereal chemistry .....	....	.....	.....	21	2	23	23	....
Concrete mixtures .....	....	.....	.....	10	.....	10	10	....
Dental:								
Clinical work .....	....	.....	.....	....	1	1	1	....
Crown and bridge work	16	.....	16	....	.....	....	....	16
Dental infirmary .....	....	2	2	....	.....	....	....	2
Local anesthesia and difficult extraction..	....	.....	.....	28	.....	28	28	....
Orthodontia	21	.....	21	22	.....	22	1	....
Perodontia	1	.....	1	....	.....	....	....	1
Electric metermen	43	.....	43	33	.....	33	....	10
Embalmers:								
Embalmers	38	3	41	76	.....	76	35	....
Institute of funeral di- rectors	65	1	66	127	1	128	62	....
Institute for tuberculosis and public health	3	17	20	....	.....	....	....	20
Parents and sex educa- tion .....	....	.....	.....	....	47	47	47	....
Scout leaders:								
Boy scout leaders....	53	.....	53	66	.....	66	13	....
Camp leadership	17	37	54	6	47	53	....	1
First aid course.....	....	.....	.....	21	.....	21	21	....
Textiles:								
Dayton's	8	8	16	....	.....	....	....	16
Rayon short course...	....	.....	.....	9	12	21	21	....
Vocational high school	7	10	17	....	.....	....	....	17
Retail merchandising...	21	2	23	8	.....	8	....	15
Grand total short courses	295	78	373	427	110	537	164	....
Less duplicates..	....	.....	.....	1	.....	1	1	....
Net total short courses	295	78	373	426	110	536	163	....
CORRESPONDENCE	1,317	1,517	2,834	1,400	1,725	3,125	291	....
Grand total exten- sion	4,686	4,844	9,530	5,203	5,343	10,546	1,016	....
Less duplicates..	88	119	207	100	155	255	48	....
Net total extension..	4,598	4,725	9,323	5,103	5,188	10,291	968	....

THE PRESIDENT'S REPORT

TABLE V. SUMMARY, 1928-30

DIVISION	YEAR 1928-29			YEAR 1929-30			GAIN	LOSS
	Men	Women	Total	Men	Women	Total		
Collegiate students	9,326	7,387	16,713	9,500	7,377	16,877	164	....
Subcollegiate students..	1,864	1,367	3,231	2,399	1,497	3,896	665	....
Totals	11,190	8,754	19,944	11,899	8,874	20,773	829	....
Less duplicates...	19	3	22	12	5	17	....	5
Net totals	11,171	8,751	19,922	11,887	8,869	20,756	834	....
Extension students	4,598	4,725	9,323	5,103	5,188	10,291	968	....
Grand totals	15,769	13,476	29,245	16,990	14,057	31,047	1,802	....
Less duplicates...	1,027	935	1,962	963	1,051	2,014	52	....
Net grand totals...	14,742	12,541	27,283	16,027	13,006	29,033	1,750	....

TABLE VI. COMPARATIVE REGISTRATION FIGURES, 1928-30

COLLEGE OR SCHOOL	YEAR 1928-29			YEAR 1929-30			GAIN		Loss	
	Men	Women	Total	Men	Women	Total	Men	Women	Men	Women
Unassigned .....	.....	.....	.....	14	9	23	14	9	.....	.....
Science, Literature, and the Arts.....	3,110	2,118	5,228	3,040	2,224	5,264	....	106	70	.....
Engineering and Architecture	1,496	30	1,526	1,579	22	1,601	83	.....	.....	8
Agriculture (includ- ing short courses)	2,157	1,645	3,802	2,688	1,803	4,491	531	158	.....	.....
Law	267	5	272	275	8	283	8	3	.....	.....
Medicine (including Nursing and Med- ical Technicians)..	678	756	1,434	689	701	1,390	11	.....	.....	55
Dentistry (including Dental Hygienists)	276	56	332	269	59	328	....	3	7	.....
Mines and Metallurgy	135	.....	135	157	.....	157	22	.....	.....	.....
Pharmacy	135	22	157	137	15	152	2	.....	.....	7
Chemistry	304	4	308	312	9	321	8	5	.....	.....
Education (including University High School)	547	1,583	2,130	606	1,609	2,215	59	26	.....	.....
Business Adminis- tration	362	56	418	397	76	473	35	20	.....	.....
Graduate	976	377	1,353	992	417	1,409	16	40	.....	.....
Summer Session (net)	2,579	3,462	6,041	2,604	3,263	5,867	25	.....	.....	199
Totals	13,022	10,114	23,136	13,759	10,215	23,974	737	101	.....	.....
Less duplicates	1,851	1,363	3,214	1,872	1,346	3,218	21	.....	.....	17
Net totals	11,171	8,751	19,922	11,887	8,869	20,756	716	118	.....	.....
Extension:										
General Extension	3,074	3,249	6,323	3,377	3,508	6,885	303	259	.....	.....
Short courses	295	78	373	426	110	536	131	32	.....	.....
Correspondence ..	1,317	1,517	2,834	1,400	1,725	3,125	83	208	.....	.....
Totals	4,686	4,844	9,530	5,203	5,343	10,546	517	499	.....	.....
Less duplicates	88	119	207	100	155	255	12	36	.....	.....
Net totals	4,598	4,725	9,323	5,103	5,188	10,291	505	463	.....	.....
Summary:										
Totals, resident students	11,171	8,751	19,922	11,887	8,869	20,756	716	118	.....	.....
Totals, extension students	4,598	4,725	9,323	5,103	5,188	10,291	505	463	.....	.....
Grand totals...	15,769	13,476	29,245	16,990	14,057	31,047	1,221	581	.....	.....
Less duplicates	1,027	935	1,962	963	1,051	2,014	....	116	64	.....
Net grand totals	14,742	12,541	27,283	16,027	13,006	29,033	1,285	465	.....	.....

TABLE VII. DEGREES CONFERRED, 1928-30

COLLEGES AND DEGREES	YEAR 1928-29			YEAR 1929-30		
	Men	Women	Total	Men	Women	Total
SCIENCE, LITERATURE, AND THE ARTS:						
B.A. <i>summa cum laude</i>	3	3	6	2	5	7
B.A. <i>magna cum laude</i>	3	5	8	8	10	18
B.A. <i>cum laude</i>	21	30	51	27	20	47
B.S. <i>cum laude</i> .....	....	3	3	....	5	5
B.A.	125	83	208	149	100	249
Bachelor of Music.....	....	....	....	....	1	1
B.S. (academic-medical)	79	9	88	60	7	67
B.S. (arts and nursing).....	....	1	1	....	6	6
B.S.	1	39	40	....	48	48
ENGINEERING AND ARCHITECTURE:						
Bachelor of agricultural engineering with distinction .....	....	....	....	2	....	2
Bachelor of aeronautical engineering .....	....	....	....	4	....	4
Bachelor of architectural engineering	11	....	11	11	....	11
Bachelor of civil engineering with distinction .....	....	....	....	1	....	1
Bachelor of civil engineering.....	29	....	29	28	....	28
Bachelor of electrical engineering with distinction	2	....	2	2	....	2
Bachelor of electrical engineering...	66	....	66	82	....	82
Bachelor of mechanical engineering with distinction .....	....	....	....	1	....	1
Bachelor of mechanical engineering..	45	....	45	27	....	27
Bachelor of architecture.....	12	....	12	10	....	10
Bachelor of interior architecture.....	1	6	7	....	7	7
AGRICULTURE:						
B.S. with distinction (agriculture)...	2	....	2	1	....	1
B.S. (agriculture)	14	....	14	23	....	23
B.S. with distinction (agricultural science)	1	2	3	2	....	2
B.S. (agricultural science)	4	....	4	5	....	5
B.S. with high distinction (forestry)	3	....	3	1	....	1
B.S. with distinction (forestry).....	5	....	5	1	....	1
B.S. (forestry)	10	....	10	21	....	21
B.S. with high distinction (home eco- nomics) .....	....	....	....	....	2	2
B.S. with distinction (home eco- nomics) .....	....	3	3	....	1	1
B.S. (home economics) .....	....	26	26	....	31	31
AGRICULTURE AND EDUCATION:						
B.S. with high distinction (home eco- nomics) .....	....	....	....	....	2	2
B.S. with distinction (home eco- nomics) .....	....	6	6	....	3	3
B.S. (home economics) .....	....	56	56	....	33	33
B.S. with distinction (agriculture)... .....	....	....	....	2	....	2
B.S. (agriculture)	2	....	2	7	1	8
AGRICULTURE AND BUSINESS ADMINIS- TRATION:						
Bachelor of business administration in agriculture	3	....	3	4	....	4
LAW:						
LL.B.	70	1	71	71	2	73
MEDICINE:						
M.D. with distinction.....	1	....	1	....	....	....
M.D.	110	8	118	129	4	133

TABLE VII--Continued

COLLEGES AND DEGREES	YEAR 1928-29			YEAR 1929-30		
	Men	Women	Total	Men	Women	Total
M.B. with distinction				4		4
M.B.	140	4	144	112	6	118
B.S.				30	13	43
Graduate in nursing.....		119	119		139	139
DENTISTRY:						
D.D.S.	81		81	83	2	85
Graduate dental hygienist.....		12	12		23	23
MINES AND METALLURGY:						
E.M.	5		5	8		8
E.M. in geology	6		6	6		6
Metallurgical engineer	6		6	6		6
PHARMACY:						
B.S. in pharmacy	5	4	9	17	3	20
Pharmaceutical chemist	23	4	27	19	3	22
CHEMISTRY:						
Bachelor of chemistry.....	6		6	4	1	5
Bachelor of chemical engineering with distinction	2		2	1		1
Bachelor of chemical engineering.....	29		29	25		25
EDUCATION:						
B.S. with high distinction.....	2	12	14	4	8	12
B.S. with distinction.....	8	54	62	11	48	59
B.S.	88	305	393	84	333	417
BUSINESS ADMINISTRATION:						
Bachelor of business administration with distinction	2	1	3	2	1	3
Bachelor of business administration..	112	16	128	124	23	147
GRADUATE:						
M.A.	61	31	92	77	38	115
M.S.	29	10	39	38	7	45
M.S. in chemical engineering.....	4		4	10		10
M.S. in civil engineering.....	2		2	1		1
M.S. in electrical engineering.....	2		2	1		1
M.S. in mechanical engineering.....	3		3			
M.S. in pharmacy	1		1			
Master of laws	3		3	1		1
E.E.	2		2	1		1
M.E.				1		1
M.S. in dermatology	2		2	1		1
M.S. in medicine	18		18	4		4
M.S. in neurology				1		1
M.S. in ophthalmology	2		2			
M.S. in orthopedic surgery.....	3		3			
M.S. in oto-laryngology	1		1			
M.S. in pathology				1		1
M.S. in pediatrics	1		1	1		1
M.S. in physiology		1	1			
M.S. in proctology				1		1
M.S. in surgery	4		4	15		15
M.S. in urology				1		1
Ph.D.	61	8	69	57	7	64
Ph.D. in surgery				3		3
Totals	1,337	862	2,199	1,436	943	2,379

TABLE VIIIa. SCHOOLS FROM WHICH ENTRANTS WERE ACCEPTED,

1928-29

	Science, Literature, and the Arts	Engineering & Architecture	Agriculture	Nursing	Dental Hygienists	Mines and Metallurgy	Pharmacy	Chemistry	Education	Total
MINNESOTA HIGH SCHOOLS:										
Aitkin	3	2	1							6
Albert Lea	10	2		1	1		1			15
Alexandria	7		1	1			1			10
Annandale	2									2
Anoka	2	1	1							4
Appleton	3		1						1	5
Arlington	1		1							2
Askov	1		1							2
Atwater	1	1								2
Aurora	1	1		1						3
Austin	8	3	1	1					1	14
Bagley	2									2
Balaton		1		2						3
Barnum	2		1					1		4
Battle Lake	1	1							1	3
Baudette		1								1
Bayfield	1									1
Belgrade			1	2				1		4
Belle Plaine	1									1
Bemidji	4	5	2							11
Benson	4	1								5
Bertha	2									2
Bird Island	1									1
Biwabik	1		2							3
Blackduck						1				1
Blooming Prairie	1									1
Bloomington					1					1
Blue Earth		2		1					1	4
Braham	2									2
Brainerd	8	7							1	16
Brandon	2									2
Breckenridge				1						1
Bricelyn				1						1
Brownton				1						1
Buffalo	2			2				1		5
Buffalo Lake	3	1		1						5
Caledonia	2									2
Cambridge	2		1							3
Cannon Falls	2	1	1							4
Carver	1									1
Center City	1									1
Chaska	2	1	1							4
Chatfield	1									1
Chisago City	3		1							4
Chisholm	3			1					1	5
Chokio	1									1
Claremont	1									1
Clarkfield	3						1			4
Clear Lake	1									1
Clearwater				1						1
Clinton		1								1
Cloquet	2							2	1	5
Cokato	2	1								3
Coleraine					1					1
Columbia Heights	2	3	1							6
Comfrey				1						1
Cottonwood		1								1
Cromwell		1		1						2
Crookston	2	1		1						4
Crosby-Ironton	5		1			1				7
Cyrus				1						1

TABLE VIIIa—Continued

	Science, Literature, and the Arts	Engineering & Architecture	Agriculture	Nursing	Dental Hygienists	Mines and Metallurgy	Pharmacy	Chemistry	Education	Total
Lester Prairie	.....	.....	.....	.....	.....	.....	1	.....	.....	1
Le Sueur	1	.....	3	.....	.....	.....	1	.....	.....	5
Le Sueur Center	1	.....	.....	.....	.....	.....	.....	.....	.....	1
Lindstrom	4	.....	1	.....	.....	.....	.....	.....	.....	5
Litchfield	3	.....	.....	.....	.....	.....	.....	.....	.....	3
Little Falls	1	.....	.....	1	1	.....	.....	.....	.....	3
Littlefork	.....	.....	1	.....	.....	.....	.....	.....	.....	1
Long Prairie	4	.....	.....	1	.....	.....	.....	.....	.....	5
Luverne	4	.....	.....	.....	.....	.....	.....	.....	.....	4
McGregor	1	.....	.....	.....	.....	.....	.....	.....	.....	1
Madison	3	.....	2	1	.....	.....	.....	.....	.....	6
Mankato	7	2	1	1	.....	.....	.....	2	.....	13
Marietta	.....	.....	.....	2	.....	.....	.....	.....	.....	2
Marshall	.....	2	.....	.....	.....	.....	1	.....	.....	3
Meadowlands	2	.....	.....	.....	.....	.....	.....	.....	.....	2
Melrose	1	.....	.....	.....	.....	.....	.....	1	.....	2
Milan	1	.....	1	.....	.....	.....	.....	.....	.....	2
Minneapolis	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Central	119	29	15	4	1	3	.....	4	14	189
East	1	2	.....	.....	.....	.....	.....	.....	.....	3
Edison	27	12	3	.....	.....	2	.....	3	4	51
John Marshall	52	5	3	1	1	1	.....	2	2	67
North	123	29	5	2	3	7	7	6	9	191
Roosevelt	27	9	3	.....	1	2	.....	1	.....	43
South	62	20	3	2	.....	5	.....	2	4	98
University	19	5	2	.....	.....	.....	.....	2	5	33
Washburn	48	5	3	1	.....	.....	1	3	5	66
West	150	24	6	1	.....	1	.....	3	16	201
Minnesota	1	.....	.....	.....	.....	1	.....	.....	.....	2
Minnesota Lake	.....	.....	.....	.....	.....	.....	1	.....	.....	1
Montevideo	4	1	.....	.....	.....	.....	2	.....	1	8
Montgomery	.....	2	.....	.....	.....	.....	.....	.....	.....	2
Monticello	.....	3	2	.....	.....	.....	.....	.....	1	6
Moose Lake	2	.....	.....	.....	.....	.....	.....	1	.....	3
Mora	1	.....	.....	.....	.....	.....	.....	1	.....	2
Morgan	.....	.....	.....	1	.....	.....	.....	.....	.....	1
Morris	.....	.....	.....	1	.....	.....	.....	.....	.....	1
Morton	2	.....	.....	.....	.....	.....	.....	.....	.....	2
Mound	1	.....	.....	.....	.....	.....	.....	.....	.....	1
Mountain Lake	.....	1	.....	.....	.....	.....	.....	.....	.....	1
Nashua	1	.....	.....	.....	.....	.....	.....	.....	.....	1
Nashwauk	.....	.....	.....	2	.....	.....	.....	.....	.....	2
Nevis	.....	.....	1	.....	.....	.....	.....	.....	.....	1
New Auburn	.....	1	.....	.....	.....	.....	.....	.....	.....	1
Newburg	.....	.....	.....	.....	.....	.....	.....	.....	1	1
New Prague	1	.....	1	1	.....	.....	.....	1	.....	4
New Ulm	7	3	.....	.....	.....	.....	.....	.....	.....	10
New York Mills	2	.....	1	1	.....	.....	.....	.....	1	5
North Branch	1	.....	.....	.....	.....	.....	1	.....	2	4
Northfield	3	.....	2	.....	.....	.....	.....	.....	.....	5
North St. Paul	3	.....	.....	.....	.....	.....	.....	.....	.....	3
Olivia	.....	.....	1	.....	.....	.....	.....	.....	1	2
Ortonville	.....	.....	.....	.....	.....	.....	.....	1	.....	1
Osakis	1	.....	.....	.....	.....	.....	.....	.....	.....	1
Osseo	1	.....	.....	.....	.....	.....	.....	.....	.....	1
Owatonna	2	2	1	1	.....	.....	.....	1	.....	7
Parker's Prairie	1	1	.....	.....	.....	.....	.....	.....	.....	2
Park Rapids	.....	2	1	.....	.....	.....	.....	.....	.....	3
Pelican Rapids	1	.....	.....	1	.....	.....	.....	.....	.....	2
Pequot	1	.....	.....	.....	.....	.....	.....	.....	.....	1
Perham	.....	2	.....	.....	.....	.....	.....	1	.....	4
Pine City	1	1	.....	.....	.....	.....	.....	.....	1	3
Pipestone	2	1	.....	.....	.....	.....	.....	.....	.....	3
Plainview	.....	.....	.....	2	.....	.....	1	.....	.....	3

TABLE VIIIa—Continued

	Science, Literature, and the Arts	Engineering & Architecture	Agriculture	Nursing	Dental Hygienists	Mines and Metallurgy	Pharmacy	Chemistry	Education	Total
Preston		1								1
Princeton	2	2								4
Randolph		1								1
Red Wing	8	3	1	2				1	1	16
Redwood Falls	2								1	3
Rochester	6	1						1		8
Rockford				1						1
Roseau		3	1	1		1				6
Rush City	1	1								2
Rushford	1									1
St. Charles			1							1
St. Cloud	6			1				2		9
St. Francis	1									1
St. James	2			1						3
St. Louis Park	5	1								6
St. Paul										
Central	92	12		2	1	1	1	9	3	121
Humboldt	14	5	1	2		1		2	4	29
Johnson	19	9	3	2					4	37
Mechanic Arts	46	14	8			1		6	6	81
St. Paul Park	1		1							2
St. Peter		1								1
Sandstone	1						1			2
Sauk Centre	2			1						3
Sebeka	1	1								2
Shakopee	4	1	1							6
Sherburn			1							1
Silver Lake	4			1						5
Skeley									1	1
Slayton	1	1						1		3
Sleepy Eye	1							1		2
South St. Paul	1	1	1	1			1	1		6
Springfield	3							1		4
Spring Grove			1							1
Spring Valley	3	2	1			1		1		8
Staples	1	1	1						1	4
Stewart	1									1
Stewartville				1						1
Stillwater	6	1	2							9
Strandquist	2									2
Swanville			1							1
Taylor Falls	3	1	1					1		6
Thief River Falls	2	2		2						6
Tracy	2							1		3
Twin Valley								1		1
Two Harbors	4			3					1	8
Upsala		1								1
Virginia	1	2		1					1	5
Wabasha	1									1
Wabasso	1									1
Waconia			1							1
Wadena		2								2
Walker	1									1
Walnut Grove		1								1
Warren	2		1							3
Waseca	6		1	2	1					10
Watertown	1									1
Waterville	1	1			1					3
Wayzata	6			2					2	10
West Concord	1	3								4
White Bear	6	5		1						12
Willmar	5	1							1	7
Windom	1	1	2							4
Winnebago			1	1						2

TABLE VIIIa—Continued

	Science, Literature, and the Arts	Engineering & Architecture	Agriculture	Nursing	Dental Hygienists	Mines and Metallurgy	Pharmacy	Chemistry	Education	Total
Winona	11		1							12
Winthrop	3	1		3				1		8
Worthington	1			1						2
Young America	1									1
Zumbrota	1		1							2
Totals	1,210	323	142	102	13	32	23	71	107	2023
OTHER SECONDARY SCHOOLS:										
Collegeville										
St. John's U.	3									3
Crookston		1		1						2
N. W. School of Agr.										
Duluth				1						1
Cathedral H. S.										
Faribault										
St. Mary's Hall	3									3
Shattuck	11	1	1					1		14
Graceville										
St. Mary's Academy	4									4
Minneapolis										
Blake School	1									1
De La Salle	9	2						1		12
Minnehaha Academy	4	2	2		1				2	11
Minnesota College..	9	2		2				1	1	15
Northrop Collegiate..	14									14
Northwestern Prep..		1								1
St. Margaret's Acad.	13			1					1	15
Morris										
West Central School of Agriculture	1		1							2
Owatonna										
Pillsbury Academy..	3									3
Rollingstone										
Holy Trinity	1									1
St. Cloud										
Cathedral H. S.		1								1
St. Joseph										
St. Benedict's Acad.	1		2							3
St. Paul										
Augsberg Academy..									1	1
Bethel Academy		1								1
Breck School	2	1								3
Cent. School of Agr.	1		2	1					1	5
Concordia H. S.	2									2
Cretin	13	11						3		27
Derham Hall	4						1		1	6
Oak Hall	4		1							5
St. Joseph's Acad..	9									9
St. Paul Academy..	1									1
St. Paul Institute..	2									2
St. Thomas Academy	9	2	2					2		15
Visitation Convent .	6									6
Waseca										
Sacred Heart H. S.	1									1
Willow City										
Notre Dame H. S.				1						1
Winona										
St. John's H. S.						1				1
Totals	131	25	11	7	1	1	1	8	7	192

TABLE VIIIa—Continued

	Science, Literature, and the Arts	Engineering & Architecture	Agriculture	Nursing	Dental Hygienists	Mines and Metallurgy	Pharmacy	Chemistry	Education	Total
UNITED STATES:										
California										
Los Angeles										
Hollywood	1									1
San Diego	1									1
Colorado										
Denver	1									1
Connecticut										
Suffield	1									1
District of Columbia										
Mt. Vernon Seminary	1									1
Florida										
Ponce de Leon	1									1
Georgia										
Riverside Military Academy	1									1
Idaho										
Burley	1									1
Coeur d'Alene	1									1
Spirit Lake		1								1
Illinois										
Carbondale	1									1
Chicago										
Austin	3									3
Chicago Training School				1						1
Englewood	1	1								2
Hyde Park	1									1
Immaculata	1									1
Lindblom		2								2
Starrett	1									1
Des Plaines		1								1
Galva	1									1
Geneva	2							1		3
Glenbard Township..									1	1
Glen Ellyn									1	1
Harvard	1									1
Lyons Township	1									1
Moline	1									1
Oak Park						1				1
Pecatonica	1									1
Pekin	1									1
Peoria	3									3
Rockford	2	1								3
West Aurora	1									1
Indiana										
Bristol					1					1
Gary				1					1	2
Indianapolis	1									1
Terre Haute	1									1
Vincennes	1									1
Zionsville		1								1
Iowa										
Akron							1			1
Algona	1									1
Ames				1						1
Battle Creek		1								1
Buffalo Center		1		1						2
Cedar Rapids	1									1
Charles City	1								1	2
Clarkville				1						1
Cresco				1						1

TABLE VIIIa—Continued

	Science, Literature, and the Arts	Engineering & Architecture	Agriculture	Nursing	Dental Hygienists	Mines and Metallurgy	Pharmacy	Chemistry	Education	Total
Wisconsin										
Antigo	2									2
Ashland		1		2						3
Baldwin		1								1
Barron	1								1	3
Bayfield									1	1
Chippewa Falls	2	2		1						5
Clayton		1								1
Eau Claire	4									4
Elena				1						1
Elmwood	1									1
Fond du Lac		1								1
Fountain City	1									1
Fox Lake									1	1
Gilman			1							1
Green Bay	1	1								2
Hawkins	1									1
Hudson		1						1		2
Hurley	1									1
Kenosha	1									1
Kemper Hall	1									1
La Crosse	1	2							1	4
Lake Geneva			1							1
Madison	1									1
Mamitowoc			1							1
Marinette	1									1
Marshfield			1							1
Mauston	1									1
Menominee	1									1
Merrill				1						1
Merrillan	1									1
Milwaukee										
Holy Angels Acad.				1						1
New Auburn				2						2
New Richmond	3								1	4
Osceola		1								1
Oshkosh				1						1
Owen	2	1	1							4
Phillips			1							1
Plymouth										
Mission House Acad.	2									2
Prairie du Chien		1								1
Racine	1	1								2
Rice Lake	2									2
St. Croix Falls	1		1					1		3
Shell Lake			1							1
Spooner	1	2								3
Stevens Point	2									2
Superior	4	1								5
Tomahawk	1									1
Viroqua		1								1
Wanwatosa		1								1
Waupaca	1									1
Wausau	1		1							2
Webster	1									1
Withee	1									1
Totals for U.S. except Minnesota	230	59	16	50	4	3	5	10	25	402
FOREIGN COUNTRIES:										
Canada	2	4		1						7
Palestine		1								1
Philippine Islands	5									5
Totals	7	5		1						13
Entered by examination	21		1	3					1	26
Grand totals	1599	412	170	163	18	36	29	89	140	2656

TABLE VIIIb—Continued

	Unassigned	Science, Literature, and the Arts	Engineering & Architecture	Agriculture	Nursing	Dental Hygienists	Mines and Metallurgy	Pharmacy	Chemistry	Education	Total
Conneaut										1	1
Cromwell		1									1
Crookston		5	1		5						11
Crosby-Ironton		1				1				2	4
Dassel		2				1					2
Dawson		5									5
Deep Haven										1	1
Deer Creek		1									1
Deer Park					1						1
Deer River		2	1								3
Delano		1								1	2
Delavan				2							2
Detroit Lakes		8			2					1	11
Dover				1							1
Duluth											
Central		15	4	2	2					2	25
Denfeld		3	3	1	1					2	10
Eagle Bend					1						1
East Chain					1						1
East Grand Forks			1								1
Echo		1									1
Elgin		1									1
Elk River		1	3								4
Ellendale		1	1	1				1			4
Elmore				1							1
Ely		1			2						3
Eveleth					1						1
Excelsior		6		1						1	8
Fairmont		10	1		1	1					13
Faribault		3	2								5
Farmington		3			1					1	5
Fergus Falls		3							1		4
Floodwood										1	1
Foley			2		2						4
Forest Lake		1		1							2
Fountain		1									1
Franklin				1	2						3
Garden City				4							4
Gibbon		1									1
Gilbert		1			1						2
Glencoe		2	1	2					1		6
Glenwood		1	2						1		4
Gonvick		1									1
Good Thunder		1									1
Graceville		1			1						2
Granada		1									1
Grand Marais		1									1
Granite Falls		1		1	1						3
Greenbush		1			1						2
Grove City					1						1
Hallock		1									1
Hancock		1									1
Harmony		1									1
Hastings		6	1							1	8
Hector		1	1	2					1		4
Hendricks			1								1
Henning		3									3
Hibbing					6					1	7
Hills			2								2
Hinckley		1									1
Hitterdal		1			1						1
Hoffman					1						1
Hopkins		5	3	1		1	1		2		13
Howard Lake					1						1

TABLE VIIIb—Continued

	Unassigned	Science, Literature, and the Arts	Engineering & Architecture	Agriculture	Nursing	Dental Hygienists	Mines and Metallurgy	Pharmacy	Chemistry	Education	Total
Spring Grove		1		2							3
Spring Valley		2							1		3
Starbuck		1									1
Stewartville		1								1	2
Stillwater		6	1								7
Swanville		1		2							3
Taunton				1							1
Thief River Falls		7	2						1	1	11
Tracy		1		2							3
Truman		1							1		2
Two Harbors		6	3								9
Tyler		4								1	5
Upsala		1									1
Villard		1	1								2
Virginia		1			1					2	4
Wabasha		1			2						3
Waconia		1	1	1						1	4
Wadena		1	1								2
Wahkon		1		1							2
Walker		3									3
Walnut Grove								1			1
Warren					1						1
Waseca		3					1				4
Watertown		1									1
Waterville		2		1	1						4
Wayzata		2		1	1				2		6
Welcome		2									2
Westbrook			1								1
Wheaton		1		1							2
White Bear		4	4		1						9
Willmar	1	8	1						1	1	12
Windom	1	6									7
Winnebago		1									1
Winona		9	5	2					1		17
Winthrop		1		1							2
Wood Lake		1									1
Worthington		4	1	1							6
Zumbrota		1									1
Totals	12	1277	321	180	96	16	36	3	77	105	2123
OTHER SECONDARY SCHOOLS:											
Bird Island											
St. Mary's High School		1									1
Collegeville											
St. John's Univ.		1									1
Crookston											
Northwest School of Agriculture...				1							1
Faribault											
St. Mary's Hall ..		1								1	2
Shattuck		10	1								11
Glencoe											
Stevens Seminary ..		1									1
Minneapolis											
Blake School		1	2								3
De La Salle		4	5						2		11
Minnehaha Academy		4	2								6
Minnesota College		11	3	2	3				1		20
Northrop Collegiate		2								2	4
St. Margaret's Academy		8		1						2	11

TABLE VIIIb—Continued

	Unassigned	Science, Literature, and the Arts	Engineering & Architecture	Agriculture	Nursing	Dental Hygienists	Mines and Metallurgy	Pharmacy	Chemistry	Education	Total
Sumner				1							1
Swea City		2	1								3
University Park John Fletcher Academy		1									1
Waterloo		2									2
Webster City		1									1
Wesley		1									1
Winterset			1								1
Kansas											
Agenda		1									1
Kansas City		2									2
Kentucky											
Louisville										1	1
Louisiana											
New Orleans		1									1
Shreveport		1									1
Massachusetts											
Boston											
Chauncey Hall School		1									1
Braintree		1									1
Brookline		2									2
Fall River			1								1
Marlborough		1									1
Winthrop		1									1
Michigan											
Benton Harbor		1									1
Bessemer		3	1	1						1	6
Escanaba		1									1
Flint		1									1
Highland Park										1	1
Iron Mountain			1								1
Iron River		1	1								2
Ishpeming		1									1
Norway		2									2
Rapidan		1									1
Sault Ste. Marie		1									1
Wakefield		2									2
Missouri											
Kansas City		1									1
Overland										1	1
St. Louis											
Principia		1									1
Sumner		2									2
Montana											
Anaconda		2									2
Billings		3							1		4
Cascade		1									1
Custer County		3									3
Cut Bank			1								1
Fairview			1								1
Great Falls		1									1
Hardin		1									1
Harlem				1							1
Havre										1	1
Helena		1									1
Kalispell			1								1
Livingston					2						2
Lodge Grass			1								1
Wolf Point		1							2		3
Nebraska											
Laurel		1									1
North Platte											1
Omaha		4	3								7
Rushville					1						1
Spencer									1		1

TABLE VIIIb—Continued

	Unassigned	Science, Literature, and the Arts	Engineering & Architecture	Agriculture	Nursing	Dental Hygienists	Mines and Metallurgy	Pharmacy	Chemistry	Education	Total
Clara City		1									1
Colfax					1						1
Cumberland		1	2			1					4
Delafield											
St. John's Mil. Acad.		2									2
Downing		1			1						2
Eau Claire		2	2		1						5
Elk Mound			1		1						1
Ellsworth			1						1		2
Frederic		1	1								2
Grantsburg		1	1								2
Green River			1								1
Hammond			1								1
Hartford			1								1
Kettle Falls		1									1
La Crosse		2	2								4
Ladysmith		2	1								3
Lake Geneva											
Northwestern Mil. and Nav. Acad.		1									1
Luck		1									1
Madison			1		1						2
Menominee										1	1
Merillon		1									1
Milwaukee			1								1
Mondovi				1					1		2
Ncenah				1							1
Neillsville					1						1
Nelson				1							1
New Richmond		2									2
Oconto					1						1
Osceola					1						1
Oshkosh		1									1
Platteville			1								1
Plymouth		1									1
Rice Lake		1	2								3
Rio		1									1
River Falls				1							1
St. Croix Falls		1									1
Sparta		1									1
Spooner					1						1
Tomah			1								1
Tomahawk				1							1
Union Grove		1									1
Waupaca		1									1
Wausau				2							2
Withee		2									2
Wyoming											
Cody		1	1								2
Washakie County		1									1
Worland		1									1
Totals for U.S. ex- cept Minnesota		256	76	21	41		3		13	13	423
FOREIGN COUNTRIES:											
Balboa Canal Zone			1								1
Canada		2		1							3
China		1									1
Hawaii		1									1
Norway							1				1
Philippine Islands		3	1		1						5
Totals		7	2	1	1		1				12
Entered by examination		9	2	3			1				15
Grand totals	12	1656	423	217	145	17	44	4	94	125	2737

TABLE IXa. STUDENTS ADMITTED WITH ADVANCED STANDING, 1928-29

	S., L., and A.	Eng. and Arch.	Agri- cul- ture	Law	Medi- cine	Nurs- ing	Den- tistry	Dental Hygien- ists	Mines and Met.	Phar- macy	Chem- istry	Edu- cation	Busi- ness Adm.	Total
MINNESOTA:														
Augsburg College	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	.....	5
Carleton College	43	8	1	1	3	.....	I	.....	1	.....	.....	15	1	74
College of St. Benedict (St. Joseph)	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	3	.....	5
College of St. Catherine	14	.....	1	.....	.....	1	.....	.....	.....	.....	.....	7	.....	23
College of St. Teresa	3	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	4	.....	8
College of St. Thomas	35	5	.....	3	5	.....	.....	.....	.....	.....	2	1	1	52
Concordia College (Moorhead)	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5
Concordia College (St. Paul)	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Gustavus Adolphus	9	1	1	.....	2	.....	.....	.....	.....	.....	.....	5	.....	20
Hamline University	15	3	3	2	.....	1	1	.....	.....	2	4	5	4	40
Junior College (Duluth) .....	.....	1	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4
Junior College (Ely)	5	.....	1	.....	.....	.....	1	.....	.....	.....	.....	2	.....	9
Junior College (Eveleth)	7	3	.....	1	1	.....	.....	.....	.....	.....	.....	4	.....	16
Junior College (Hibbing)	9	7	4	.....	.....	.....	3	.....	.....	.....	2	10	3	44
Junior College (Itasca)	6	1	.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....	9
Junior College (Rochester)	8	4	1	.....	4	.....	1	.....	1	.....	.....	3	2	24
Junior College (Virginia)	3	1	3	1	.....	.....	.....	.....	1	1	.....	6	1	17
Luther College (St. Paul)	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Macalester College	19	2	5	4	2	1	1	.....	1	.....	.....	2	1	38
Morningside College (Fairmont) ..	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
Park Region Lutheran College (Fergus Falls)	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
Red Wing Seminary .....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
St. John's University (Collegeville) ..	7	4	.....	1	2	.....	.....	.....	.....	.....	1	.....	.....	15
St. Mary's College	2	3	.....	1	1	.....	1	.....	.....	.....	1	.....	3	12
St. Mary's Hall	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
St. Olaf College	16	3	6	.....	4	.....	1	.....	.....	.....	.....	.....	.....	3
State Teachers College (Bemidji) ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	.....	35
State Teachers College (Duluth) ..	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	3	.....	3
State Teachers College (Mankato) ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9	.....	10
State Teachers College (Moorhead) ..	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	6	.....	7
State Teachers College (St. Cloud) ..	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	7	.....	8
State Teachers College (Winona) ..	1	.....	3	.....	.....	.....	.....	.....	1	.....	.....	14	.....	14
Totals	219	49	35	14	24	3	12	.....	3	6	12	126	16	519

TABLE IXa—Continued

	S., L., and A.	Eng. and Arch.	Agri- cul- ture	Law	Medi- cine	Nurs- ing	Den- tistry	Dental Hygien- ists	Mines and Met.	Phar- macy	Chem- istry	Edu- cation	Busi- ness Adm.	Total
Des Moines, University of (Iowa)	....	I	....	....	....	....	....	....	....	....	....	....	....	1
Detroit, University of (Michigan)	....	I	....	....	....	....	....	....	....	....	....	....	....	1
Dickinson State Teachers College (North Dakota)	....	I	....	....	....	....	....	....	....	....	....	I	....	2
Drake University (Iowa)	3	....	I	I	....	....	....	....	....	....	....	I	....	6
Dubuque College (Iowa)	....	....	....	....	....	....	....	....	....	....	....	I	....	1
Eastern State Teachers College (South Dakota)	....	I	....	....	....	I	....	....	....	....	....	I	....	3
Eau Claire State Teachers College (Wis.)	I	4	I	....	....	....	....	....	....	....	I	I	....	8
Elgin Junior College (Illinois)	I	....	....	....	....	....	....	....	....	....	....	I	....	1
Ellsworth College (Iowa)	....	....	....	....	....	....	....	....	....	....	....	I	....	1
Estherville Junior College (Iowa)	....	....	....	....	....	....	....	....	....	....	....	I	....	1
Ferris Institute (Michigan)	....	....	....	....	....	....	I	....	....	....	....	I	....	1
Ferry Hall (Illinois)	I	....	....	....	....	....	....	....	....	....	....	....	....	1
Fort Dodge Junior College (Iowa)	I	....	....	....	....	....	....	....	....	....	....	....	....	1
Fresno State College (California)	....	I	....	....	....	....	....	....	....	....	....	....	....	1
George Washington University (District of Columbia)	2	....	....	....	....	....	....	....	....	....	....	....	....	2
Georgetown University (District of Columbia)	I	....	....	....	....	....	....	....	....	....	....	....	....	1
Georgia State College	....	....	....	....	....	....	....	....	....	....	....	I	....	1
Goucher College (Maryland)	I	....	....	....	....	....	....	....	....	....	....	....	....	1
Graceland College (Iowa)	....	....	....	....	....	....	....	....	....	....	....	I	....	1
Grafton Hall (Wisconsin)	....	....	I	....	....	....	....	....	....	....	....	....	....	1
Grinnell College (Iowa)	4	....	....	....	....	....	....	....	....	....	....	....	....	4
Harvard (Massachusetts)	....	....	....	2	I	....	....	....	....	....	....	....	....	3
Hillsdale College (Michigan)	I	....	....	....	....	....	....	....	....	....	....	....	....	1
Hiram College (Ohio)	....	....	....	....	....	....	....	....	....	....	....	I	....	1
Huron College (South Dakota)	5	I	....	....	....	....	....	....	....	....	....	....	....	6
Idaho College	I	....	....	....	....	....	....	....	....	....	....	....	....	1
Idaho, University of	I	....	....	....	....	....	I	....	....	....	....	....	....	1
Illinois, University of	4	....	....	....	....	....	I	....	....	....	....	3	....	8
Indiana State Normal School	....	....	....	....	....	....	....	....	....	....	....	I	....	1
Intermountain Union College (Montana)	2	....	....	....	....	....	....	....	....	....	....	....	....	2
Iowa State College	5	3	....	....	....	....	....	....	....	....	I	....	....	9

TABLE IXa—Continued

	S., L., and A.	Eng. and Arch.	Agri- cul- ture	Law	Medi- cine	Nurs- ing	Den- tistry	Dental Hygien- ists	Mines and Met.	Phar- macy	Chem- istry	Edu- cation	Busi- ness Adm.	Total
Trinity College (District of Columbia)	1	....	....	....	....	....	....	....	....	....	....	....	....	1
United States Military Academy (New York) .....	....	1	....	....	....	....	....	....	....	....	....	....	....	1
Upper Iowa University	1	....	....	....	....	....	....	....	....	....	....	1	....	2
Valley City Teachers College (North Dakota)	2	....	1	....	....	....	....	....	....	....	....	....	....	6
Valparaiso University (Indiana)..	1	....	....	....	....	....	....	....	....	....	....	3	....	1
Vassar College (New York)	1	....	....	....	....	....	....	....	....	....	....	....	....	1
Ward Belmont College (Tennessee)	....	....	....	....	....	....	....	....	....	....	....	....	1	1
Washington State College	1	....	....	....	....	....	....	....	....	....	....	....	....	1
Washington, University of	11	....	....	....	....	....	....	....	....	....	....	....	....	11
Wellesley College (Massachusetts)	1	....	1	....	....	....	....	....	....	....	....	....	....	2
Wells College (New York)	1	....	....	....	....	....	....	....	....	....	....	....	....	1
Wentworth College (New Jersey)..	1	....	....	....	....	....	....	....	....	....	....	....	....	1
Western Union College (Iowa)	1	....	....	....	....	....	....	....	....	....	....	....	....	1
Westminster College (Missouri)..	1	....	....	....	....	....	....	....	....	....	....	....	....	1
Wichita, University of (Kansas)..	1	....	....	....	....	1	....	....	....	....	....	....	....	1
Wiley College (Texas) .....	....	....	....	....	....	....	....	....	....	....	....	1	....	1
Wilson College (Pennsylvania) ..	....	....	....	....	....	....	....	....	....	....	....	1	....	1
Wisconsin, University of	10	....	....	....	....	....	....	....	....	....	....	....	....	16
Wittenberg College (Ohio) .....	....	....	1	....	....	....	....	....	....	....	....	5	....	1
Yale (Connecticut) .....	....	1	....	....	....	....	....	....	....	....	....	....	....	1
Yankton College (South Dakota)..	2	....	....	....	....	1	....	....	....	....	....	1	....	4
Totals	239	47	42	19	4	9	22	....	3	2	8	81	8	484
FOREIGN COUNTRIES:														
Bialystah Gymnasium (Poland)...	....	....	....	....	....	....	....	....	....	....	....	1	....	1
Hawaii, University of	1	....	....	....	....	....	....	....	....	....	....	....	....	1
Hebrew Teachers College (Jerusalem) .....	....	....	....	....	....	....	....	....	....	....	....	2	....	2
Manitoba, University of (Canada)	1	1	....	....	....	....	....	....	....	....	....	....	....	6
Queens University (England)	1	....	....	....	....	....	4	....	....	....	....	....	....	1
Senior Matriculation Examinations (Canada) .....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Trondhjem Katedral School (Norway) .....	....	1	....	....	....	....	....	....	....	....	1	....	....	1
Tsing Hua (China) .....	....	....	2	....	....	....	....	....	....	....	....	....	....	2
Totals	3	2	2	....	....	....	4	....	....	....	1	3	....	15
Grand totals	461	68	79	33	28	12	38	....	6	8	21	210	24	1018

TABLE IXb. STUDENTS ADMITTED WITH ADVANCED STANDING, 1929-30

	S., L., and A.	Eng. and Arch.	Agric- ulture	Law	Medi- cine	Nurs- ing	Den- tistry	Dental Hygien- ists	Mines and Met.	Phar- macy	Chem- istry	Edu- cation	Busi- ness Adm.	Total
MINNESOTA:														
Augsburg College	2	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	1	7
Carleton College	32	5	4	1	2	.....	.....	1	.....	.....	2	7	4	58
College of St. Benedict	3	.....	2	1	.....	.....	.....	.....	.....	.....	1	1	.....	8
College of St. Catherine	15	.....	.....	.....	1	.....	.....	1	.....	.....	.....	2	.....	19
College of St. Teresa	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	.....	9
College of St. Thomas	3	1	.....	1	3	.....	2	.....	.....	.....	.....	.....	.....	10
Concordia College (Moorhead)	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Concordia College (St. Paul)	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	20
Gustavus Adolphus	5	3	2	2	3	.....	3	.....	.....	.....	.....	2	.....	1
Hamline University	13	1	3	1	.....	.....	1	.....	.....	.....	1	4	1	25
Junior College (Duluth)	8	7	1	1	2	.....	3	.....	2	2	.....	7	7	40
Junior College (Ely)	2	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	3	1	7
Junior College (Eveleth)	6	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	12
Junior College (Hibbing)	11	8	6	3	7	2	.....	.....	.....	.....	1	18	3	59
Junior College (Itasca) .....	.....	1	1	1	.....	.....	.....	1	.....	.....	.....	1	.....	6
Junior College (Rochester)	14	4	1	1	.....	.....	1	.....	.....	.....	.....	.....	1	22
Junior College (Virginia)	4	6	.....	2	1	.....	1	.....	.....	.....	1	7	1	23
Luther College (St. Paul) .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
Macalester College (St. Paul)	19	1	3	.....	1	.....	.....	.....	1	1	1	6	1	34
North Central College	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	2
Park Region Lutheran College (Fergus Falls) .....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Red Wing Seminary	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
St. John's University	3	2	.....	1	1	.....	1	.....	2	.....	.....	2	1	11
St. Mary's College	4	1	.....	.....	2	.....	1	.....	.....	.....	.....	.....	.....	8
St. Mary's Hall	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
St. Olaf College	22	2	1	1	2	.....	1	.....	.....	2	.....	3	.....	34
State Teachers College (Bemidji) .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	2
State Teachers College (Duluth) .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	.....	5
State Teachers College (Mankato)	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	10	.....	12
State Teachers College (Moorhead) .....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	4	.....	5
State Teachers College (St. Cloud) .....	.....	1	3	.....	.....	.....	.....	.....	.....	.....	.....	20	.....	24
State Teachers College (Virginia) .....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
State Teachers College (Winona) .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9	.....	9
Totals	179	49	31	17	25	2	14	3	3	5	7	123	23	481

TABLE IXb—Continued

	S., L., and A.	Eng. and Arch.	Agric- ulture	Law	Medi- cine	Nurs- ing	Den- tistry	Dental Hygien- ists	Mines and Met.	Phar- macy	Chem- istry	Edu- cation	Busi- ness Adm.	Total
UNITED STATES:														
Alabama, University of.....	....	....	....	....	I	....	....	....	....	....	....	....	....	1
Amherst College (Massachusetts)..	1	I	....	....	....	....	....	....	....	....	....	....	....	2
Antioch College (Ohio).....	2	....	....	....	....	....	....	....	....	....	....	....	....	2
Arkansas, University of.....	....	....	....	I	....	....	....	....	....	....	....	....	....	1
Armour Institute of Technology (Illinois).....	....	I	....	....	....	....	....	....	....	....	....	....	....	1
Augustana College (South Dakota)	4	I	....	....	....	....	....	....	....	....	....	....	....	5
Barnard College (New York).....	1	....	....	....	....	....	....	....	....	....	....	....	....	1
Bellingham State Normal (Wash- ington).....	....	....	....	....	....	....	....	....	....	....	....	I	....	1
Boston University (Massachusetts)	1	....	....	....	....	....	....	....	....	....	....	....	I	1
Burlington Junior College (Iowa)..	....	....	....	....	....	....	....	....	....	....	....	....	I	1
California, University of.....	2	2	....	....	....	....	....	....	....	....	....	2	....	6
California, University of (in Los Angeles).....	2	....	....	....	....	....	....	....	....	....	....	....	....	2
Carroll College (Wisconsin).....	1	....	....	....	....	....	....	....	....	....	....	....	....	1
Central Missouri Teachers College	....	....	....	....	....	....	....	....	....	....	....	I	....	1
Central State Teachers College (Wisconsin).....	3	....	2	....	....	....	....	....	....	....	....	....	....	5
Chicago, University of.....	4	....	I	....	I	....	....	....	....	....	....	....	....	6
Chicago Y.M.C.A. School.....	1	....	I	....	....	....	....	....	....	....	....	....	....	1
Cincinnati, University of (Ohio)..	....	....	....	....	....	....	....	....	....	....	....	I	....	1
Coe College (Iowa).....	2	....	....	I	....	I	....	....	....	....	....	....	....	4
Colorado State Agricultural College	1	....	I	....	....	....	....	....	....	....	....	....	....	2
Colorado State Teachers College..	....	....	....	....	....	....	....	....	....	....	....	I	....	1
Colorado, University of.....	3	....	....	....	....	....	....	....	....	....	....	....	....	3
Columbia College (Iowa).....	....	....	....	....	....	....	....	....	....	....	....	I	....	1
Columbia College (South Dakota)	1	....	....	....	....	....	....	....	....	....	....	....	....	1
Columbia University (New York)..	1	....	....	....	....	I	....	....	....	....	....	I	....	3
Cornell College (Iowa).....	1	....	....	....	....	....	....	....	....	....	....	....	....	1
Crane Jr. College (Illinois).....	1	....	....	....	....	....	....	....	....	....	....	....	....	1
Creighton University (Nebraska)..	3	....	....	I	....	....	I	....	....	....	....	....	I	6
Creston Jr. College (Iowa).....	1	I	....	....	....	....	....	....	....	....	....	....	....	2
Dakota Wesleyan (South Dakota)..	4	....	I	....	....	....	....	....	....	....	....	....	....	5
Dana College (Nebraska).....	3	....	I	....	....	....	....	....	....	....	....	....	....	4
Dartmouth (New Hampshire).....	1	....	....	....	....	....	....	....	....	....	....	....	....	1
Denver, University of.....	....	....	I	....	....	....	....	....	....	....	....	....	....	1
Des Moines, University of.....	....	I	....	....	I	....	....	....	....	I	....	I	....	4

TABLE IXb—Continued

	S., L., and A.	Eng. and Arch.	Agri- cul- ture	Law	Medi- cine	Nurs- ing	Den- tistry	Dental Hygien- ists	Mines and Met.	Phar- macy	Chem- istry	Edu- cation	Busi- ness Adm.	Total
Detroit, University of (Michigan).....	1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
Dickinson State Teachers College (North Dakota).....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1	.....	.....	3
Drake University (Iowa).....	3	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	4
Eau Claire State Teachers College (Wisconsin).....	.....	1	1	.....	.....	.....	1	.....	.....	.....	1	2	.....	6
Ellsworth College (Iowa).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
Elmhurst College (Illinois).....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Emory College (Georgia).....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Emporia College (Kansas).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
Estherville Jr. College (Iowa).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	2
Eureka College (Illinois).....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Evansville College (Indiana).....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Fisk University (Tennessee).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1
Florida, University of.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Fort Dodge Jr. College (Iowa).....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Geneva College (Pennsylvania).....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Georgetown University (District of Columbia).....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Georgetown Visitation Convent (Dis- trict of Columbia).....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
George Washington University (District of Columbia).....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
Glendale Jr. College (California).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
Gonzaga University (Washington).....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
Grinnell College (Iowa).....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Harvard (Massachusetts).....	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	2
Hastings College (Nebraska).....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Hollins College (Virginia).....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Huron College (South Dakota).....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
Idaho, University of.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
Illinois, University of.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	3
Illinois Women's College.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	2
Indiana, University of.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Intermountain Union College (Mon- tana).....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Iowa State College.....	6	2	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11
Iowa State Teachers College.....	2	.....	1	.....	.....	.....	.....	.....	.....	.....	1	2	.....	5
Iowa, University of.....	6	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	1	.....	9

TABLE IXb—Continued

	S., L. and A.	Eng. and Arch.	Agric- ul- ture	Law	Medi- cine	Nurs- ing	Den- tistry	Dental Hygien- ists	Mines and Met.	Phar- macy	Chem- istry	Edu- cation	Busi- ness Adm.	Total
St. Louis University (Missouri) ..	....	....	....	....	I	....	I	....	....	....	....	....	....	2
St. Viator College (Illinois)	I	....	....	....	....	....	....	....	....	....	....	....	....	I
Simpson College (Iowa)	I	....	....	....	....	....	....	....	....	....	....	I	....	2
Sioux Falls College (South Dakota)	4	....	....	2	....	....	....	....	....	....	....	....	....	6
Smith College (Massachusetts)	2	....	....	....	....	....	....	....	....	....	....	....	....	2
South Dakota State College	3	I	....	....	I	....	....	....	....	I	....	3	I	10
South Dakota State School of Mines .....	....	I	....	....	....	....	....	....	....	I	....	....	....	2
South Dakota, University of	7	....	2	....	....	....	....	....	....	....	....	4	....	13
Southern California, University of Southwest Missouri State Teachers College	2	....	....	....	....	....	....	....	....	....	....	....	....	2
Stanford University (California) ..	I	....	I	....	....	....	....	....	....	....	....	....	....	2
Stephens Junior College (Missouri)	....	....	....	....	....	....	....	....	....	....	....	I	....	I
Stout Institute (Wisconsin)	I	....	....	....	....	....	....	....	....	....	....	....	....	I
Stout Institute (Wisconsin)	2	....	2	....	....	....	....	....	....	....	....	....	....	4
Stowes Teachers College (Missouri)	I	....	....	....	....	....	....	....	....	....	....	....	....	I
Sullins College (Virginia)	I	....	....	....	....	....	....	....	....	....	....	....	....	I
Superior State Teachers College (Wisconsin)	I	....	....	....	....	....	....	....	....	....	....	....	....	I
Superior State Teachers College (Wisconsin)	10	I	I	....	....	....	....	....	....	I	I	8	....	22
Sweet Briar College (Virginia)	I	....	....	....	....	....	....	....	....	....	....	....	....	I
Syracuse, University of (New York)	I	....	....	....	....	....	....	....	....	....	....	....	....	I
Tempe State Teachers College (Arizona)	I	....	....	....	....	....	....	....	....	....	....	I	....	2
Temple University (Pennsylvania)	....	....	....	....	....	....	....	....	....	....	....	....	....	I
Temple University (Pennsylvania)	I	....	....	....	....	....	....	....	....	....	....	....	....	I
Upper Iowa University	I	....	....	....	....	....	....	....	....	....	....	I	....	2
Valley City Teachers College (North Dakota)	3	....	I	....	....	....	....	....	....	....	....	....	....	7
Valparaiso University .....	....	I	....	I	I	....	....	....	....	....	....	....	....	3
Wabash College (Indiana) .....	....	I	....	....	....	....	....	....	....	....	....	....	....	I
Ward Belmont College (Tennessee)	I	....	....	....	....	....	....	....	....	....	....	....	....	I
Washington State College	I	....	....	....	....	....	....	....	....	....	....	....	....	I
Washington State Normal School	....	....	I	....	....	....	....	....	....	....	....	....	....	I
Washington, University of	I	....	....	....	....	....	....	....	....	....	....	I	I	3
Wayne State Teachers College (Nebraska) .....	....	....	....	....	....	....	....	....	....	....	....	....	....	I
Wayne State Teachers College (Nebraska) .....	....	....	....	....	....	....	....	....	....	....	....	I	....	I
Webster City Junior College (Iowa)	I	....	....	....	....	....	....	....	....	....	....	....	....	I
Western Reserve University (Ohio)	....	....	....	....	....	....	....	....	....	....	....	I	....	I

TABLE IXb—Continued

	S., L., and A.	Eng. and Arch.	Agricul- ture	Law	Medi- cine	Nurs- ing	Den- tistry	Dental Hygien- ists	Mines and Met.	Phar- macy	Chem- istry	Edu- cation	Busi- ness Adm.	Total
Western State Teachers College (Michigan) .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
West Virginia, University of	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	I	.....	1
Whitewater Teachers College (Wisconsin) .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
Williams College (Massachusetts)..	I	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	I	.....	1
Wisconsin, University of	10	I	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Wyoming, University of .....	.....	I	.....	.....	.....	I	.....	.....	I	I	.....	I	.....	15
Yale University (Connecticut).....	I	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Yankton College (South Dakota)...	I	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
Totals	235	43	35	21	13	5	17	I	2	5	7	86	12	482
FOREIGN COUNTRIES:														
Artium Examination	I	.....	.....	.....	.....	.....	I	.....	.....	.....	.....	.....	.....	2
Gymnasium (Sweden) .....	.....	.....	.....	.....	.....	.....	I	.....	.....	.....	.....	.....	.....	1
Hebrew Teachers College (Jerusalem)	I	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
Lingnan University (China)	I	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	I	.....	1
Manitoba, University of (Canada)	2	.....	.....	.....	.....	.....	I	.....	.....	.....	.....	.....	.....	1
Moscow State University (Russia)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	I	4
Philippines, University of .....	.....	.....	I	.....	.....	.....	.....	.....	.....	.....	.....	.....	I	1
Queensland, University of (Australia) .....	.....	.....	.....	.....	.....	.....	I	.....	.....	.....	.....	.....	.....	1
Regina Collegiate Institute (Canada)	I	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Saskatchewan, University of .....	.....	.....	I	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Senior Matriculation Examination (Canada)	2	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Vaxjo University (Sweden).....	I	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4
Western Australia College of Dentistry .....	.....	.....	.....	.....	.....	.....	I	.....	.....	.....	.....	.....	.....	1
Totals	9	2	2	.....	.....	.....	5	.....	.....	.....	.....	.....	2	21
Grand totals	423	94	68	38	38	7	36	4	5	10	14	210	37	984

TABLE Xa. GEOGRAPHICAL DISTRIBUTION OF UNIVERSITY STUDENTS OF COLLEGIATE GRADE (OTHER THAN SUMMER SESSION),

1928-29

	S., L., and A.	Eng. and Arch.	Agri- cul- ture	Law	Medi- cine	Med. Tech- nicians	Nurs- ing	Den- tistry	Dental Hygien- ists	Mines and Met.	Phar- macy	Chem- istry	Edu- cation	Busi- ness Adm.	Grad- uate	Dupli- cates	Total
MINNESOTA:																	
Aitkin	7	7	2	....	1	....	2	....	....	....	....	....	1	1	....	....	21
Anoka	13	4	2	1	2	....	....	....	....	....	....	....	5	....	5	1	31
Becker	18	5	5	2	3	....	3	....	....	1	1	1	5	....	2	....	49
Beltrami	9	5	4	1	2	....	5	....	....	....	1	2	8	3	....	1	39
Benton	1	2	....	....	1	....	....	....	....	....	....	1	1	....	1	....	7
Big Stone	10	3	4	2	1	....	....	1	....	2	....	2	8	....	....	3	30
Blue Earth	26	7	8	5	8	1	7	2	1	1	2	7	16	3	5	3	96
Brown	15	8	8	3	4	....	5	4	....	3	1	2	5	....	1	2	57
Carlton	10	7	6	2	5	....	6	3	....	....	1	3	9	2	2	5	51
Carver	23	5	3	....	1	....	4	2	....	....	....	....	9	1	1	2	47
Cass	5	3	1	....	1	....	....	....	....	....	....	1	2	1	1	1	14
Chippewa	16	3	5	1	4	....	2	....	....	....	3	....	4	2	1	1	40
Chisago	26	4	5	....	1	....	2	....	....	1	5	2	6	2	4	5	53
Clay	7	1	3	....	1	....	1	1	1	1	....	....	6	3	3	3	25
Clearwater	3	2	3	....	....	....	2	....	....	....	....	....	1	....	....	1	10
Cook	2	2	3	1	....	....	1	....	....	....	....	....	1	....	1	....	11
Cottonwood	12	9	6	....	3	....	1	2	....	....	....	....	1	3	3	1	39
Crow Wing	26	12	8	1	7	....	3	1	....	2	....	3	16	1	4	7	77
Dakota	21	9	11	1	4	....	3	1	....	....	3	....	6	2	4	4	61
Dodge	6	6	4	1	1	....	....	1	....	....	1	....	5	....	1	2	24
Douglas	18	....	6	2	1	....	4	4	....	1	1	....	7	2	2	2	46
Faribault	7	4	8	....	2	....	4	4	....	1	1	....	13	1	3	5	43
Fillmore	23	10	6	3	4	....	5	1	....	2	....	3	11	3	2	2	71
Freeborn	30	7	3	....	4	....	4	....	1	3	2	....	7	5	2	2	65
Goodhue	26	10	15	2	7	....	7	5	....	1	....	2	14	....	7	3	93
Grant	10	....	3	1	2	....	1	1	....	....	....	1	3	....	3	1	24
Hennepin	2475	601	260	95	192	4	169	97	29	57	60	118	755	152	415	267	5212
Houston	8	2	2	....	1	....	1	....	....	....	....	....	1	....	1	....	16
Hubbard	8	1	4	....	1	....	3	1	....	....	....	4	4	....	....	3	23
Isanti	16	1	2	1	3	....	....	....	....	....	1	....	3	4	1	4	28
Itasca	20	6	3	3	5	1	8	1	1	....	2	1	14	4	1	9	61
Jackson	9	4	2	....	1	....	1	....	....	....	....	1	4	2	1	....	25
Kanabec	4	....	....	....	2	....	1	....	....	....	....	....	3	1	....	1	10
Kandiyohi	18	6	3	1	....	1	6	1	....	....	....	....	7	1	3	2	45
Kittson	5	1	....	....	....	....	3	1	....	....	....	....	1	....	1	....	12
Koochiching	7	7	3	....	1	....	1	....	....	....	....	....	3	1	1	2	22

TABLE Xa—Continued

	S., L., and A.	Eng. and Arch.	Agricul- ture	Law	Medi- cine	Med. Tech- nicians	Nurs- ing	Dent- istry	Dental Hygien- ists	Mines and Met.	Pharm- acy	Chem- istry	Educa- tion	Busi- ness Adm.	Grad- uate	Duplic- ates	Total
Lac qui Parle	15	3	6	.....	3	.....	5	1	.....	.....	4	.....	6	.....	.....	4	39
Lake	11	4	1	.....	1	.....	5	4	.....	.....	4	1	5	4	2	5	37
Lake of the Woods.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
Le Sueur	16	7	8	2	4	.....	1	.....	.....	1	3	1	8	2	.....	5	48
Lincoln	7	3	3	.....	2	.....	2	.....	.....	.....	.....	1	5	1	1	3	22
Lyon	15	8	3	3	3	.....	9	3	.....	1	.....	2	5	3	2	4	53
McLeod	21	5	9	2	7	.....	9	5	.....	2	4	.....	11	1	6	3	79
Marshall	9	1	2	.....	1	.....	2	.....	1	1	.....	.....	1	.....	1	2	17
Martin	24	7	11	.....	7	.....	9	1	.....	1	.....	3	8	1	3	4	71
Mahnomen .....	.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	2
Meeker	12	3	3	1	3	.....	3	.....	.....	1	.....	.....	8	2	2	1	37
Mille Lacs	12	3	3	.....	.....	.....	1	1	.....	.....	.....	1	7	.....	3	3	29
Morrison	12	4	2	2	5	.....	1	5	.....	.....	.....	.....	6	5	7	5	44
Mower	25	18	6	.....	6	.....	6	1	.....	.....	1	3	11	2	5	6	78
Murray	7	1	1	1	.....	.....	.....	1	.....	1	.....	1	1	.....	.....	.....	14
Nicollet	7	5	1	.....	1	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	17
Nobles	10	3	.....	.....	1	.....	1	1	.....	.....	.....	.....	4	.....	2	.....	22
Norman	4	2	2	.....	1	.....	3	.....	.....	.....	1	4	.....	.....	.....	.....	19
Olmsted	35	8	4	.....	19	.....	4	4	.....	1	2	8	3	14	6	.....	96
Otter Tail	38	14	12	3	5	.....	5	2	2	2	.....	2	16	7	2	5	105
Pennington	9	4	3	.....	.....	.....	3	.....	.....	.....	.....	.....	2	.....	.....	1	20
Pine	16	6	4	1	3	.....	2	1	1	1	2	.....	4	1	2	3	41
Pipestone	6	4	1	2	1	.....	.....	.....	.....	.....	.....	2	1	1	2	1	19
Polk	17	3	5	4	1	.....	4	3	.....	.....	.....	1	5	4	2	3	46
Pope	6	4	5	1	5	.....	4	.....	1	.....	.....	.....	5	2	1	4	30
Ramsey	837	254	151	41	128	3	42	24	10	13	20	62	232	61	186	112	1952
Red Lake	1	.....	1	.....	2	.....	3	.....	.....	.....	.....	.....	.....	2	.....	.....	9
Redwood	12	4	3	.....	4	.....	3	.....	.....	1	.....	.....	8	3	2	2	38
Renville	16	6	9	1	6	.....	11	1	.....	1	1	2	12	3	.....	4	65
Rice	24	7	5	4	11	.....	3	2	.....	.....	1	1	8	1	4	2	69
Rock	15	1	2	.....	.....	.....	1	.....	.....	.....	.....	.....	4	1	.....	.....	24
Roseau	2	7	1	.....	.....	.....	7	1	.....	2	.....	1	4	.....	.....	3	22
St. Louis	151	78	50	22	48	1	41	15	1	1	5	14	121	19	20	44	543
Scott	11	3	6	.....	1	1	2	2	.....	1	.....	1	4	2	1	3	19
Sherburne	3	2	6	.....	.....	1	.....	.....	.....	.....	.....	1	3	1	4	2	19
Sibley	16	6	1	.....	.....	.....	12	3	.....	.....	2	.....	5	1	1	1	48
Stearns	53	12	10	1	8	.....	12	2	.....	.....	.....	4	27	3	14	11	135
Steele	20	9	8	2	2	.....	2	1	.....	2	1	3	8	.....	5	2	61

TABLE Xa—Continued

	S., L., and A.	Eng. and Arch.	Agri- culture	Law	Medi- cine	Med. Tech- nicians	Nurs- ing	Den- tistry	Dental Hygien- ists	Mines and Met.	Phar- macy	Chem- istry	Edu- cation	Busi- ness Adm.	Grad- uate	Dupli- cates	Total
Stevens	7	....	6	....	....	....	2	1	....	....	....	....	3	1	....	1	19
Swift	24	1	4	2	....	....	3	....	....	....	2	1	7	....	2	....	44
Todd	22	6	4	....	3	....	6	....	....	....	....	1	7	....	....	1	48
Traverse	1	2	....	1	1	....	2	....	....	....	....	....	4	....	....	....	11
Wabasha	14	2	3	1	5	....	2	4	....	....	4	2	9	1	3	4	46
Wadena	7	3	....	....	....	....	....	....	....	....	....	1	....	....	3	....	14
Waseca	18	3	9	....	5	....	5	1	1	....	....	....	6	....	2	2	48
Washington	33	20	10	3	3	....	8	1	....	2	....	2	9	5	5	2	99
Watonwan	9	4	4	2	5	....	5	2	....	1	....	....	0	4	1	....	37
Wilkin	2	3	1	1	....	....	3	1	....	....	....	....	1	....	....	....	12
Winona	26	12	9	5	9	....	3	3	....	1	....	3	9	2	4	4	82
Wright	26	9	8	2	2	1	....	1	....	7	2	2	10	4	2	8	68
Yellow Medicine	11	1	6	....	8	....	7	....	....	....	2	....	8	1	1	4	41
Totals	4635	1343	824	240	606	14	530	233	50	116	147	278	1605	354	803	627	11151
UNITED STATES:																	
Alabama	1	1	1	2	1	....	....	....	....	....	....	....	....	....	7	1	12
Arkansas	1	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	4
California	6	1	1	....	4	....	1	....	....	....	....	....	1	....	11	1	24
Colorado .....	....	....	....	1	1	....	1	....	....	....	....	1	....	....	12	....	16
Connecticut	1	....	....	....	2	....	....	1	....	....	....	....	....	....	1	....	5
District of Columbia	1	1	....	....	1	....	....	....	....	....	....	....	....	....	7	....	10
Florida .....	....	....	....	....	....	....	1	1	....	....	....	....	1	....	1	....	4
Georgia	1	....	....	....	....	....	....	1	....	....	....	....	....	....	7	....	9
Idaho	7	1	....	....	1	....	1	....	....	....	....	....	....	1	1	1	11
Illinois	30	9	....	....	4	....	1	2	....	2	1	1	5	1	27	3	80
Indiana	5	1	1	....	....	....	2	....	....	....	....	....	2	....	11	....	22
Iowa	93	16	9	8	5	1	21	1	....	5	3	3	31	19	32	20	227
Kansas	3	2	....	1	2	....	1	....	....	....	....	....	3	....	15	....	27
Kentucky	2	1	....	....	1	....	....	....	....	....	....	....	....	....	7	....	11
Louisiana .....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2
Maine	1	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2
Maryland	1	....	....	....	....	....	1	....	....	....	....	....	....	....	5	....	6
Massachusetts	5	....	3	....	....	....	....	....	....	....	....	....	2	....	8	2	16
Michigan	13	8	1	1	3	....	2	2	....	....	....	6	2	22	1	....	59
Mississippi .....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2
Missouri	11	3	....	....	1	....	1	....	....	....	1	....	4	1	18	1	39
Montana	29	13	3	....	11	....	6	1	....	....	1	2	10	1	11	3	85

TABLE Xa—Continued

	S., L., and A.	Eng. and Arch.	Agric- ulture	Law	Medi- cine	Med. Tech- nicians	Nurs- ing	Den- tistry	Dental Hygien- ists	Mines and Met.	Phar- macy	Chem- istry	Edu- cation	Busi- ness Adm.	Grad- uate	Dupli- cates	Total
Nebraska	11	8	2	1	2	.....	1	1	.....	.....	.....	1	3	1	15	3	43
Nevada	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
New Hampshire	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	2
New Jersey	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	2	1	6
New Mexico .....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	1	1	1
New York	9	2	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	18	.....	31
North Carolina .....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	6	.....	7
North Dakota	91	26	13	3	17	1	61	11	2	.....	1	7	32	10	28	16	287
Ohio	3	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	19	.....	23
Oklahoma	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	7
Oregon	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7	.....	8
Pennsylvania	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1	.....	35	.....	38
Rhode Island .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	2
South Carolina .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12	.....	12
South Dakota	96	20	7	8	9	2	30	2	.....	3	.....	.....	.....	.....	12	.....	12
Tennessee	3	.....	.....	.....	.....	.....	.....	1	.....	1	.....	3	22	7	21	13	217
Texas	4	4	2	.....	2	.....	.....	.....	1	.....	.....	.....	1	.....	7	.....	13
Utah .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	.....	18
Vermont	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6	.....	6
Virginia .....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1	1	.....	1	3
Washington .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9	.....	10
Washington	9	2	1	.....	4	.....	1	.....	.....	.....	1	.....	.....	.....	11	1	28
West Virginia .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	2
Wisconsin	112	54	30	7	23	.....	37	11	1	3	1	9	58	14	41	17	382
Wyoming	1	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	5
Totals	563	172	75	32	101	4	169	35	4	14	9	27	186	60	461	87	1825
FOREIGN COUNTRIES:																	
Argentina .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
Australia .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	.....	3
Austria .....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Canada	9	6	.....	.....	2	.....	1	8	.....	2	1	1	3	1	50	1	83
China	1	1	3	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	7	1	12
Cuba .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	1
Denmark .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
England .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	2
Germany .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	2	.....	3
Hawaii	1	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	2
India .....	.....	.....	1	.....	.....	.....	1	.....	.....	1	.....	1	.....	.....	.....	1	3

TABLE Xa—Continued

	S., L., and A.	Eng. and Arch.	Agri- cul- ture	Law	Medi- cine	Med. Tech- nicians	Nurs- ing	Den- tistry	Dental Hygien- ists	Mines and Met.	Phar- macy	Chem- istry	Edu- cation	Busi- ness Adm.	Grad- uate	Dupli- cates	Total
Ireland	2	.....	2
Italy	2	.....	2
Japan	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	3
Korea	1	.....	1
Mexico	2	.....	2
New Zealand	2	.....	2
Norway	I	.....	.....	I	.....	.....	I	.....	.....	.....	.....	.....	I	.....	.....	5
Palestine	I	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	I	.....	.....	.....	2
Philippine Islands	19	I	3	.....	.....	.....	.....	.....	.....	2	.....	I	.....	.....	6	.....	32
Poland	1	.....	1
Porto Rico	1	.....	1
South Africa	1	.....	1
Switzerland	2	.....	2
Syria	I	.....	.....	.....	.....	.....	.....	.....	.....	1
Wales	I	.....	1
Totals	30	11	7	0	8	0	2	10	0	5	1	3	4	4	89	4	170
Grand totals	5228	1526	906	272	715	18	701	278	54	135	157	308	1795	418	1353	718	13146

TABLE Xb. GEOGRAPHICAL DISTRIBUTION OF UNIVERSITY STUDENTS OF COLLEGIATE GRADE (OTHER THAN SUMMER SESSION),

1929-30

	Unasigned	S., L., and A.	Eng. and Arch.	Agriculture	Law	Medicine	Med. Technicians	Nursing	Dentistry	Dental Hygienists	Mines and Met.	Pharmacy	Chemistry	Education	Business Adm.	Graduate	Duplicates	Total
MINNESOTA:																		
Aitkin	4	7	1	.....	1	.....	1	.....	.....	.....	.....	.....	2	1	.....	.....	17
Anoka	9	2	6	.....	2	.....	.....	.....	.....	.....	.....	.....	5	1	5	.....	30
Becker	1	18	5	3	1	1	.....	4	2	.....	1	1	1	5	.....	1	1	43
Beltrami	12	1	3	.....	2	.....	3	1	.....	.....	.....	2	5	1	1	.....	31
Benton	4	6	2	.....	1	.....	2	.....	.....	.....	.....	2	4	.....	1	.....	18
Big Stone	8	2	5	.....	2	.....	1	1	.....	.....	.....	.....	5	.....	2	.....	25
Blue Earth	29	16	11	4	6	.....	7	2	1	2	2	3	13	5	3	.....	98
Brown	2	25	6	6	2	4	.....	5	4	.....	2	2	4	6	.....	4	.....	67
Carlton	11	6	10	2	5	.....	4	2	.....	1	.....	4	8	.....	1	.....	49
Carver	19	2	4	1	3	.....	2	.....	.....	.....	1	.....	11	4	1	.....	44
Cass	5	6	1	1	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	15
Chippewa	18	2	3	.....	5	.....	2	1	.....	1	1	.....	4	3	2	.....	42
Chisago	22	4	6	.....	1	.....	2	.....	.....	2	4	2	6	2	3	.....	50
Clay	3	1	4	1	3	.....	1	.....	.....	1	.....	.....	2	2	.....	.....	17
Clearwater	3	1	3	.....	.....	.....	2	.....	.....	1	.....	.....	1	.....	.....	.....	11
Cook	1	2	2	1	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	7
Cottonwood	1	14	5	7	.....	3	.....	1	1	.....	.....	.....	1	4	3	3	.....	39
Crow Wing	34	10	6	.....	7	.....	5	1	.....	5	.....	3	11	2	4	.....	82
Dakota	23	10	12	2	3	.....	5	1	.....	.....	4	.....	7	2	1	.....	63
Dodge	3	3	6	1	.....	.....	1	1	.....	.....	1	2	5	.....	2	.....	22
Douglas	14	2	5	.....	2	.....	4	3	.....	1	.....	1	8	3	4	.....	42
Faribault	8	5	9	1	1	.....	3	3	.....	.....	2	.....	7	2	1	.....	37
Fillmore	22	9	6	2	3	.....	6	1	.....	1	.....	2	8	2	8	.....	65
Freeborn	25	12	4	1	3	.....	2	.....	1	1	.....	1	9	5	6	.....	67
Goodhue	28	11	16	3	6	.....	7	4	.....	1	1	3	17	2	6	.....	97
Grant	2	1	2	1	1	.....	1	.....	.....	.....	.....	1	1	1	6	.....	16
Hennepin	9	2484	633	282	95	233	9	157	73	29	73	56	128	794	187	434	307	5369
Houston	12	.....	6	1	1	.....	.....	.....	.....	.....	.....	.....	4	.....	2	.....	23
Hubbard	8	1	4	.....	.....	.....	3	1	.....	.....	.....	3	3	1	.....	.....	21
Isanti	12	4	3	.....	3	.....	.....	.....	.....	.....	1	.....	8	3	1	.....	32
Itasca	12	4	4	7	5	1	10	.....	2	.....	2	.....	18	2	3	.....	65
Jackson	6	4	2	1	1	.....	2	.....	.....	.....	.....	1	5	1	2	.....	23
Kanabec	3	.....	2	.....	3	.....	.....	.....	.....	.....	.....	2	5	.....	1	.....	15
Kandiyohi	31	9	5	2	.....	.....	5	1	.....	.....	1	.....	7	1	5	.....	53
Kittson	4	1	1	.....	.....	.....	3	1	.....	.....	.....	.....	2	.....	1	.....	13
Koochiching	11	6	2	.....	.....	.....	.....	.....	.....	1	1	.....	4	.....	1	.....	26

TABLE Xb—Continued

	Unas- signed	S., L., and A.	Eng. and Arch.	Agricul- ture	Law	Medicine	Med. Tech- nicians	Nurs- ing	Dent- istry	Dental Hygien- ists	Mines and Met.	Pharm- acy	Chem- istry	Educa- tion	Busi- ness Adm.	Grad- uate	Duplic- ates	Total
Lac qui Parle...	18	2	5	....	3	....	5	1	....	2	3	....	3	1	....	3	40
Lake	13	3	1	....	2	....	4	2	....	....	3	1	7	4	3	4	39
Lake of the Woods	2	3	....	....	....	....	....	....	....	....	....	....	....	....	....	1	4
Le Sueur	16	6	9	1	4	....	4	1	1	1	3	3	6	3	1	2	57
Lincoln	13	1	3	....	2	....	1	....	....	....	....	....	8	1	1	3	27
Lyon	9	6	7	2	3	....	6	2	....	2	....	1	9	3	1	1	50
McLeod	1	24	7	9	1	4	....	6	4	....	....	2	4	7	1	6	1	75
Mahnomen	2	1	....	1	....	2	1	....	....	....	....	....	....	....	....	7
Marshall	2	3	1	....	1	....	2	....	1	....	....	....	....	....	2	....	12
Martin	25	8	11	1	7	....	6	2	1	1	2	3	6	1	3	6	71
Meeker	11	3	4	....	2	....	2	....	....	....	2	1	8	1	3	....	37
Mille Lacs	9	3	2	2	....	....	1	....	....	....	1	....	6	....	2	1	25
Morrison	15	5	2	2	3	....	1	....	....	....	....	....	4	6	2	2	40
Mower	19	17	4	1	3	....	4	3	....	....	....	1	12	4	4	6	66
Murray	7	1	1	....	2	....	....	1	....	1	....	1	2	....	1	1	16
Nicollet	4	4	2	....	....	....	....	1	....	....	1	1	2	....	2	....	17
Nobles	10	4	2	1	1	....	....	2	....	....	....	1	3	....	1	2	25
Norman	3	3	2	....	1	....	3	....	....	....	....	1	3	....	2	2	16
Olmsted	1	34	7	7	2	13	....	2	7	....	....	2	1	8	3	28	7	108
Otter Tail	31	11	10	5	5	....	5	2	2	4	1	1	11	2	2	5	87
Pennington	12	4	4	1	....	....	1	....	....	....	....	1	9	1	2	5	30
Pine	10	9	4	....	2	....	....	1	....	....	3	....	9	2	2	1	41
Pipestone	5	7	1	2	1	....	....	1	....	....	....	....	2	....	....	1	18
Polk	24	8	5	1	1	....	9	2	....	....	....	2	5	3	1	4	57
Pope	10	6	6	1	4	....	1	....	....	....	....	....	3	1	....	6	26
Ramsey	5	859	257	163	46	126	4	38	27	11	15	17	67	217	59	203	100	2024
Red Lake	2	....	....	....	1	....	2	....	....	....	....	....	....	2	....	....	7
Redwood	13	4	5	1	4	....	2	....	....	1	3	....	6	3	1	4	39
Renville	14	3	10	1	5	....	7	....	....	....	1	3	9	3	7	5	58
Rice	28	4	4	1	9	....	2	2	1	1	....	1	8	3	6	5	65
Rock	1	15	3	1	2	....	....	....	1	....	....	....	....	3	1	1	2	26
Roseau	5	3	3	....	....	....	8	1	....	2	....	....	1	....	....	1	22
St. Louis	147	83	47	21	42	....	42	16	1	7	6	7	129	28	24	47	553
Scott	13	3	4	....	1	....	2	1	....	1	....	1	4	2	....	3	29
Sherburne	6	5	4	....	1	....	....	....	....	....	....	....	3	3	....	2	20
Sibley	15	4	2	1	....	....	9	4	....	....	1	1	3	....	1	....	41
Stearns	40	15	7	3	9	....	9	5	....	....	....	....	26	5	8	6	122
Steele	20	8	10	2	4	....	3	1	....	2	6	1	11	....	6	8	66
Stevens	7	1	6	....	....	....	....	1	....	....	....	1	5	1	....	2	20

TABLE Xb—Continued

	Unas- signed	S., L., and A.	Eng. and Arch.	Agricul- ture	Law	Medi- cine	Med. Tech- nicians	Nurs- ing	Den- tistry	Dental Hygien- ists	Mines and Met.	Phar- macy	Chem- istry	Edu- cation	Busi- ness Adm.	Grad- uate	Dupli- cates	Total
Swift	25	7	2	2	.....	.....	1	2	.....	1	2	1	9	2	3	4	53
Todd	19	7	6	1	3	.....	7	.....	.....	.....	.....	1	6	1	1	3	49
Traverse	3	3	1	2	1	.....	1	.....	.....	.....	.....	.....	2	.....	1	1	13
Wabasha	11	1	2	.....	5	.....	3	3	.....	.....	2	2	7	1	2	1	38
Wadena	10	3	7	.....	1	.....	.....	.....	1	.....	.....	.....	3	.....	3	2	26
Waseca	15	4	.....	.....	7	.....	1	1	.....	1	.....	.....	6	1	3	2	37
Washington	34	15	10	1	2	.....	5	1	1	2	1	2	13	10	4	9	92
Watsonwan	1	7	1	5	2	1	.....	5	2	.....	1	.....	.....	2	2	4	1	32
Wilkin	1	1	2	.....	.....	.....	1	1	.....	.....	.....	.....	2	.....	1	1	8
Winona	33	15	10	1	4	.....	3	3	.....	1	.....	3	7	3	.....	5	78
Wright	27	7	10	.....	1	1	6	2	.....	.....	1	.....	13	1	3	2	70
Yellow Medicine	9	.....	7	.....	6	.....	5	.....	.....	.....	2	1	5	.....	1	2	34
Totals	22	4641	1389	885	240	610	16	480	213	53	139	145	281	1640	404	867	688	11337
UNITED STATES:																		
Alabama	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	.....	7
Arizona	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	3
Arkansas	2	1	.....	1	.....	.....	.....	1	.....	.....	.....	.....	.....	1	3	2	6
California	8	2	.....	.....	5	.....	.....	.....	.....	.....	.....	.....	2	.....	12	2	28
Colorado	3	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1	.....	.....	8	.....	13
Connecticut	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....
Dist. of Columbia	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
Florida	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	4
Georgia	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
Idaho	1	.....	.....	.....	.....	.....	.....	5	.....	6
Illinois	3	.....	.....	.....	1	.....	2	.....	.....	.....	.....	1	.....	1	1	1	8
Indiana	25	12	4	2	6	.....	1	2	.....	3	1	4	4	2	31	5	92
Iowa	6	1	.....	.....	1	.....	2	.....	.....	.....	.....	.....	.....	.....	15	.....	25
Iowa	78	24	8	6	4	.....	19	3	.....	4	1	4	30	16	28	17	208
Kansas	2	1	.....	1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	.....	16
Kentucky	1	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	5	.....	10
Louisiana	5	.....	5
Maine	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	3
Maryland	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8	.....	10
Massachusetts	6	1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8	.....	17
Michigan	25	10	2	1	2	.....	1	3	.....	.....	1	2	9	4	11	1	70
Mississippi	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	.....	4
Missouri	10	1	1	.....	2	.....	1	.....	.....	.....	.....	.....	2	1	16	1	33
Montana	31	13	2	.....	14	.....	6	2	.....	.....	.....	3	9	1	8	5	84
Nebraska	13	7	.....	.....	4	.....	1	2	.....	.....	.....	.....	5	2	11	2	43

TABLE Xb—Continued

	Unas- signed	S., L., and A.	Eng. and Arch.	Agri- cul- ture	Law	Medi- cine	Med. Tech- nicians	Nurs- ing	Den- tistry	Dental Hygien- ists	Mines and Met.	Phar- macy	Chem- istry	Edu- cation	Busi- ness Adm.	Grad- uate	Dupli- cates	Total	
Ireland	1
Italy	2
Japan	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4
New Zealand.....	2
Norway	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8
Palestine	1	.....	.....	.....	.....	.....	3	.....	1	.....	.....	.....	.....	.....	.....	.....	2
Philippine Islands	10	2	1	1	2	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	2
Poland	1	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	1	.....	.....	.....	.....	25
Russia	1
Scotland	1	.....	.....	.....	1
Spain	2
Sweden	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Syria	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
Totals	33	14	7	1	5	.....	.....	13	.....	6	.....	.....	.....	.....	.....	.....	.....	170
Grand totals	23	5264	1601	980	283	723	17	650	272	56	157	152	321	1830	473	89	5	792	13419

REPORT OF THE COMPTROLLER

REPORT OF THE COMPTROLLER

To the President of the University:

SIR: I have the honor to submit herewith the annual report of the Comptroller of the University of Minnesota for the year ended June 30, 1930.

The income of the University from all sources reached a total of \$11,390,665.85¹ for the year. The state provided \$4,010,858.94 for operation, \$498,481.62 for buildings, and \$235,500.00 for special research projects and extension work. Federal Aid provided \$348,856.52. Permanent University Fund, \$155,028.17, and the Swamp Land Fund, \$73,753.42. The University in its operations, including the trust funds, added \$5,768,187.18. Instruction, research, administration, and general required \$6,057,598.74, the physical plant operation and maintenance, \$722,840.96, and new construction including improvements, \$1,084,376.20, while trust fund disbursements including the purchase of new for matured securities reached \$1,013,481.15, and service enterprises and revolving fund operations totaled \$2,264,790.77. Inter-collegiate Athletics brought in operating revenue of \$375,062.28, and accounted for expenditures of \$355,587.61. Salary disbursements from all funds for all purposes totaled \$5,407,900.59, supplies, \$1,845,269.87, and other expenses, \$1,527,032.47.

During the year the remaining outstanding bonds of the Field House issue amounting to \$155,000.00 were retired and the last of the outstanding Comprehensive Building Fund certificates, amount \$224,000.00, were also retired.

At the close of the year the cash balances in the several funds amounted to \$1,640,780.47. Deducting from this amount, however, the necessary reserve for outstanding obligations, and the balances of the funds operating on a self-supporting basis there remained a free balance available for general university purposes of \$11,459.96.

The Cyrus Northrop Memorial Auditorium, and the New Health Service, Hospital and Out-patient units of the hospital group were completed during the year and the block bounded by Fourth Street, Seventeenth Avenue, and the Northern Pacific Railroad tracks was acquired out of the Comprehensive Building Fund for military and recreational purposes.

Respectfully submitted,

W. T. MIDDLEBROOK,

Comptroller

¹ This does not include principal increases in the Permanent University Fund totaling \$596,538.05.

STATEMENT OF REVENUE

July 1, 1929 to June 30, 1930

Source	Item	Subtotal	Total
State Support			
For Operation			
Maintenance and Equipment Appropriation.....	\$3,225,000.00		
23/100 Mill Tax	433,045.40		
Minnesota General Hospital Reimbursement.....	317,813.54		
Grand Rapids Alterations	2,000.00		
Crookston Repairs and Alterations.....	18,000.00		
Morris Repairs and Alterations.....	15,000.00		
	\$4,010,858.94		
For Buildings			
Building Fund Tax—1919 Appropriation.....	433,701.94		
Building Fund Tax—1929 Appropriation.....	64,779.68		
	498,481.62		
For Special Purposes			
Agricultural Extension	50,000.00		
County Agents	86,000.00		
Manganiferous and Low Grade Ores Investigation.....	15,000.00		
Direct Process Beneficiation of Low Grade Ores.....	18,000.00		
Low Lime Soils Investigation.....	5,000.00		
Peat Soils Investigation	6,000.00		
Sandy Land Experiments.....	7,000.00		
Soils Survey	8,000.00		
Albert Lea Experimental Creamery.....	4,000.00		
Medical Research	25,000.00		
Livestock Sanitary Board.....	7,500.00		
Corn Breeding and Testing.....	4,000.00		
	235,500.00		
		\$4,744,840.56	

Federal Aid

Morrill Act	25,000.00
Nelson Act	25,000.00
Adams Act	15,000.00
Hatch Act	15,000.00
Smith-Lever Act	116,539.00
Supplementary Smith-Lever Act.....	40,927.68
Smith-Hughes Act	22,394.12
Purnell Act	60,000.00
Capper-Ketcham Act	28,995.72

348,856.52

Permanent University Fund.....

155,028.17

Swamp Land Income.....

73,753.42

University Income

Student Fees (Net)

1,167,979.89

Sales and Miscellaneous

Support Fund

546,053.59

Purnell Fund

9.11

Agricultural Extension

764.21

Direct Process Beneficiation of Low Grade Ores.....

4,864.72

Low Lime Soils Investigation.....

464.54

Peat Soils Investigation.....

187.21

Soils Survey

120.00

Albert Lea Experimental Creamery.....

18.48

Medical Research

42.40

552,524.26

1929 Building Fund Certificates of Indebtedness.....

300,000.00

2,020,504.15

Service Enterprises

2,483,757.54

Intercollegiate Athletics

375,062.28

Trust Funds.....

1,188,863.21

Total Revenue

\$11,390,665.85

STATEMENT OF EXPENDITURES

July 1, 1929 to June 30, 1930

Major Division	Total	Salaries and Wages	Supplies	Expense	Capital
Administration	\$ 187,699.94	\$ 157,443.31	\$ 6,907.17	\$ 17,914.68	\$ 5,434.78
General University	495,190.94	205,450.06	16,706.91	179,535.47	93,498.50
Resident Instruction and Research					
Science, Literature, and the Arts ...	845,604.36	781,096.31	18,252.42	17,401.21	28,854.42
Engineering and Architecture	339,212.36	288,858.15	20,633.06	6,247.58	23,473.57
Department of Agriculture.....	1,553,316.24	1,177,049.25	173,570.63	141,655.05	61,041.31
Medical School	325,784.53	281,913.22	22,338.01	13,616.93	7,916.37
Minnesota General Hospital.....	580,198.12	254,418.53	194,902.72	76,159.30	54,717.57
School of Chemistry.....	184,286.70	139,406.18	32,123.08	4,241.11	8,516.33
School of Mines and Metallurgy....	145,890.10	118,899.37	17,380.22	5,513.14	4,097.37
College of Dentistry.....	153,104.69	106,787.61	31,224.20	8,377.06	6,715.82
Law School	77,535.61	62,864.66	332.55	2,690.18	11,648.22
College of Pharmacy.....	46,238.66	38,193.54	4,683.98	1,534.37	1,826.77
College of Education.....	216,499.47	200,822.87	4,871.79	7,836.01	2,968.80
Summer Session	161,033.08	144,025.42	1,240.68	15,022.92	744.06

Graduate School	146,459.72	123,740.82	13,338.97	7,317.94	2,061.99
School of Business Administration..	115,306.98	111,326.65	1,358.12	772.11	1,850.10
Library Instruction	6,490.39	5,031.50	515.18	28.51	915.20
Military Department	5,668.31	4,637.68	568.35	403.78	58.50
Physical Education	242,425.99	120,730.82	28,940.31	86,034.15	6,720.71
Extension Division	229,652.55	181,273.08	6,715.23	38,857.51	2,806.73
Physical Plant.....	2,186,217.16	198,023.70	154,603.64	370,213.62	1,463,376.20
Total	\$ 8,243,815.90	\$4,701,992.73	\$ 751,207.22	\$1,001,372.63	\$1,789,243.32
Service Enterprises	2,264,790.77	552,966.82	1,070,539.28	403,781.99	237,502.68
Trust Funds	1,013,481.15	152,941.04	23,523.37	121,877.85	715,138.89
Grand Total	\$11,522,087.82	\$5,407,900.59	\$1,845,269.87	\$1,527,032.47	\$2,741,884.89

DETAIL OF REVENUE—STUDENT FEES

July 1, 1929 to June 30, 1930

	Regular Session	Summer Session
Collegiate		
Science, Literature, and the Arts.....	\$250,994.78	\$ 24,919.10
Engineering and Architecture.....	120,870.10	6,145.04
Agriculture, Forestry, and Home Economics.....	51,345.01	3,526.40
Law	32,015.50	1,668.42
Medicine	115,506.31	17,472.83
Nursing	3,789.50	39.80
Medical Technicians	1,741.25	65.40
Dentistry	47,339.50	3,463.70
Mines and Metallurgy.....	12,353.25	172.60
Pharmacy	13,022.70	461.40
Chemistry	23,511.20	2,002.90
Education	71,958.71	45,136.52
Business Administration	32,607.65	2,558.46
Graduate	18,836.91	22,953.16
Music	37,329.95	2,505.60
Dental Hygienists	3,833.75	20.00
Public Health Nursing.....	1,333.25	460.60

Library School	6,697.25	254.40
Miscellaneous	15,062.37	1,228.85
Non-Collegiate		
Central School of Agriculture.....	2,804.10	
Music—School of Agriculture.....	1,653.00	
University High School.....	16,564.50	
Short Courses—Agriculture	1,529.00	
	<hr/>	<hr/>
	\$ 882,699.54	\$ 135,055.18
Extension Division		
Evening Classes	112,153.28	
Short Courses	11,997.50	
Correspondence Instruction	25,051.89	
Miscellaneous	1,022.50	
	<hr/>	
	\$ 150,225.17	
SUMMARY		
Regular Session Fees.....		882,699.54
Summer Session Fees.....		135,055.18
Extension Division Fees.....		150,225.17
		<hr/>
Total		\$1,167,979.89
		<hr/>

DETAIL OF REVENUE—STUDENT ENROLMENT

July 1, 1929 to June 30, 1930

Collegiate

Science, Literature, and the Arts.....	5,264
Engineering and Architecture.....	1,601
Agriculture, Forestry, and Home Economics.....	980
Law.....	283
Medicine.....	723
Nursing.....	650
Medical Technician.....	17
Dentistry.....	328
Mines and Metallurgy.....	157
Pharmacy.....	152
Chemistry.....	321
Education.....	1,830
Business Administration.....	473
Graduates.....	1,409
Summer Session.....	5,867
Unassigned.....	23

Total.....	20,078
Less duplicates.....	3,201

Net total collegiate.....

16,877

Sub-collegiate

Central School of Agriculture.....	621
Northwest School of Agriculture.....	353
West Central School.....	388
North Central School.....	54
University High School.....	385

Net total sub-collegiate.....

1,801

Short Courses

Short Courses (Morris).....	766
Short Courses (Crookston).....	505
Scout Masters' Short Course.....	32
Creamery Operators' Short Course.....	60
Short Courses (Grand Rapids).....	421
Fur Breeders' Short Course.....	106
Ice Cream Makers' Short Course.....	26
Advanced Creamery Operation.....	28
Poultry Short Course.....	63
Regional Scout Executive.....	34
Beekeepers' Short Course.....	10
Land Management Short Course.....	86
Milk Control Officials' Short Course.....	23
Total	2,160
Less duplicates	13

Net total short courses..... 2,147

Less duplicates between sub-collegiate and short courses..... 3,948
52

Net total sub-collegiate and short courses..... 3,896

Extension Division

Extension Division	6,885
Correspondence	3,125
Short Courses	536

Total

Total non-collegiate

Less duplicates

Net total non-collegiate..... 12,156

Total, collegiate and non-collegiate..... 29,033

DETAIL OF REVENUE
July 1, 1929 to June 30, 1930

Sales and Miscellaneous

Administration

Comptroller's Office	\$	41.80	
			\$ 41.80

General University

General and Chemical Storehouse Breakage.....	\$	537.07	
Inter-Campus Trolley		9,349.63	
Library Fee		32,069.37	
Library Fines and Miscellaneous.....		2,095.68	
Library Bindery		2,883.78	
Scientific Apparatus Repair Shop		7,791.63	
Lectures and Convocations.....		1,402.00	
Truck Service		65.00	
Museum of Natural History.....		69.00	
Special Committee Service.....		2,563.04	
Interest on Deposits.....		4,174.71	
Miscellaneous		654.88	
Fees Reserved for Refunds.....		8,092.75	
Overhead—Authorizations		35,290.68	
Overhead—Service Enterprises		15,548.92	
			122,588.14

Science, Literature, and the Arts

Administration	\$	5.96	
Botany		88.00	
English		402.42	
Geography		75.50	
Geology and Mineralogy.....		45.49	
Geological Survey		180.00	
History		34.00	
Journalism		370.80	
Music		405.00	
Political Science		168.40	
Sociology		1.00	
Speech—Laboratory Fee		1,158.40	
Speech—Miscellaneous		333.04	
Zoology		85.15	
		<hr/>	3,353.16

Engineering and Architecture

Administration		300.00	
Civil Engineering		107.59	
Drawing and Descriptive Geometry.....		65.84	
Electrical Engineering		180.46	
Experimental Engineering Laboratories		83.29	
Engineering Experiment Station.....		399.13	
Mechanical Engineering		1,871.81	
Power Plant Laboratory.....		2,290.13	
		<hr/>	5,298.25

DETAIL OF REVENUE
July 1, 1929 to June 30, 1930

Sales and Miscellaneous

Agriculture, Forestry, and Home Economics

General	\$ 2,313.54
Library	144.16
Post Office and Truck Service.....	111.45
Publications	156.84
Agricultural Economics and Farm Management.....	17.60
Agricultural Engineering	27.00
Agronomy and Plant Genetics.....	326.96
Animal Husbandry	20,646.07
Biochemistry	772.76
Dairy Husbandry	9,384.72
Entomology and Economic Zoology.....	579.95
Forestry	3,332.08
Home Economics	382.66
Horticulture	16.47
Poultry Husbandry	3,027.13
Veterinary Medicine	5,623.61
Physical Training	8.65*

\$46,854.35

Agricultural Schools and Experiment Stations

Central School of Agriculture.....	\$	122.05	
Short Courses		2,102.61	
Northwest School & Experiment Station—Crookston.....		32,759.89	
West Central School & Experiment Station—Morris.....		30,166.32	
North Central School and Experiment Station—Grand Rapids.....		9,588.74	
Northeast Experiment Station—Duluth.....		8,556.21	
Southeast Experiment Station—Waseca.....		5,423.09	
Fruit Breeding Farm—Zumbra Heights.....		3,650.58	
		<hr/>	92,369.49

Medicine

Administration	\$	178.17	
Anatomy		138.62	
Bacteriology		287.85	
Medicine		29.00	
Obstetrics and Gynecology.....		175.27	
Pathology		1,264.88	
Pharmacology		188.00	
Physiology		1,248.52	
Preventive Medicine and Public Health.....		190.80	
School of Nursing.....		131.50	
		<hr/>	3,832.61

Minnesota General Hospital

Pay Bed	\$	95,675.89	
X-Ray		9,999.05	
Out-Patient		16,875.45	
Pharmacy		8,648.71	
Miscellaneous		336.03	
		<hr/>	131,535.13

* Debit.

DETAIL OF REVENUE
July 1, 1929 to June 30, 1930

Sales and Miscellaneous

Chemistry		\$ 14,842.51
Mines and Metallurgy		
Mines and Metallurgy	\$ 77.08	
Mines Experiment Station	5,862.83	
		5,939.91
Dentistry		60,295.37
Law		251.00
Pharmacy		1,731.91
Education		
Administration	\$ 467.33	
Art Education	22.50	
General Education—Practice Teaching Fee.....	2,394.11	
General Education—Music Education Fee.....	2,070.50	
General Education—Bureau of Recommendations.....	3,772.90	
Educational Research	320.56	
University High School.....	880.93	
		9,928.83

Summer Session

Recreation Fees	\$ 6,079.97
Recreation—Other Income	3,187.45
Laboratory Fees	3,872.60
Miscellaneous	759.14

13,899.16

Graduate

124.08

Library Instruction

2.50

Military Department

7.70

Physical Education

Men	\$ 2,248.62
Women	38.25

2,286.87

General Extension Division

Administration	\$ 43.06
Evening Classes—Materials	3,324.05
Correspondence—Book Rental	1,009.00
Correspondence—Miscellaneous	255.99
Lyceum	20,278.74
Radio Broadcasting	734.17

25,645.01

DETAIL OF REVENUE
July 1, 1929 to June 30, 1930

Sales and Miscellaneous

Physical Plant

MAIN CAMPUS

Administration	\$.35
Telephone and Telegraph	1,324.76
Heating Plant	1,116.74
Buildings and Campus	2,305.13

FARM CAMPUS

Heating Plant	\$ 232.00
Buildings and Campus.....	220.33
Farm Maintenance	26.50

————— \$ 5,225.81

————— \$ 546,053.59

STUDENT LOANS—July 1, 1928 to June 30, 1929

Name of Fund	No.	Aggregate Amount	Average Amount	Loans Of				Balance June 30, 1929
				Over \$200	\$100	\$100	Under \$100	
Mary Dwight Akers Loan Fund.....	28	\$ 965.00	\$34.46				28	\$ 2,859.90
Argosy Club Loan Fund.....								53.45
H. P. Bend Loan Fund.....								85.50
Earle Brown Loan Fund.....								400.00
Class of 1902 Loan Fund.....	35	1,725.00	49.28		2	2	31	675.23
Cosmopolitan Club Loan Fund.....	7	357.90	51.12			1	6	369.80
Dad's Day Loan Fund.....	1	50.00	50.00				1	257.59
Caleb Dorr Loan Fund.....	26	943.00	38.19				26	249.00
Helen Dwan Loan Fund.....								1,050.00
Elliot Trust Fund.....	14	2,025.00	144.64	2	7	1	4	246.04
Engineers' Bookstore Loan Fund.....	7	313.00	44.07				7	193.54
General Student Loan Fund.....	8	314.00	39.25				8	167.79
Gilfillan Trust Fund.....	374	18,433.02	49.28		10	33	331	4,257.65
E. M. and E. R. Johnson Foundation Loan Fund.....	13	502.00	38.61				13	230.87
Law Alumni Loan Fund.....	7	732.00	104.57		2	3	2	273.66
Lind Fund for the Aid of Deserving Crippled Children.....	11	529.00	48.00				11	1,007.65
F. D. Lindquist Loan Fund.....	4	147.00	36.75				4	198.46
Ludden Estate Loan Fund.....	38	1,870.00	49.21				33	1,139.45
Ludden Real Estate Loan Fund.....	206	11,643.50	56.52	1	18	16	171	4,122.51
Ludden Trust Fund.....	60	4,000.90	66.68		6	6	48	2,404.63
First National Bank of St. Paul Loan Fund.....	2	75.00	37.50				2	332.14
Minn. Grand Army of the Repub. and Women's Rel. Corps Loan Fund								100.00
Minnesota State Organization for Public Health Nursing Loan Fund	1	50.00	50.00				1	53.97
Dr. Nellie Welch Nelson Home Economics Student Loan Fund.....	27	976.00	36.14			1	26	24.00
Juniata Shepperd Loan Fund.....								35.94
Professional Sorority Council Loan Fund.....								133.40
Women's Christian Temperance Union (8th Ward) Loan Fund.....								71.55
Women's Auxiliary of Minneapolis Dist. Dental Society Loan Fund..	1	60.00	60.00				1	81.48
Total 1928-29.....	870	\$45,711.32	\$42.15	3	45	68	754	\$21,076.20
Total 1927-28.....	742	36,197.45	49.28	3	14	30	695	11,834.73
Total 1926-27.....	754	37,526.75	49.77	5	23	28	698	4,558.02
Total 1925-26.....	614	33,010.90	53.76	4	15	51	544	5,737.30

STUDENT LOANS—July 1, 1929 to June 30, 1930

Name of Fund	No.	Aggregate Amount	Average Amount	Loans Of				Balance June 30, 1930	
				Over \$200	\$100	\$100	Under \$100		
Mary Dwight Akers Loan Fund.....	25	\$ 1,165.00	\$46.60			3	22	\$ 1,945.50	
Argosy Club Loan Fund.....	2	60.00	30.00				2	2.55	
Agricultural Faculty Women's Club Loan Fund.....	8	261.00	32.63				8	239.00	
H. P. Bend Loan Fund.....								86.50	
Earle Brown Loan Fund.....	1	50.00	50.00				1	350.00	
Class of 1902 Loan Fund.....	19	1,072.00	56.42		1	2	16	192.98	
Cosmopolitan Club Loan Fund.....	6	230.00	38.33				6	390.30	
Dad's Day Loan Fund.....	3	250.00	83.33		1	1	1	75.49	
Caleb Dorr Loan Fund.....	11	457.00	45.18				10	268.08	
Helen Dwan Loan Fund.....								1,052.64	
Elliot Trust Fund.....	13	1,825.00	140.30	1	8		4	611.04	
Engineers' Bookstore Loan Fund.....	7	455.00	65.00		2		5	74.39	
General Student Loan Fund.....	23	1,069.00	46.47			1	22	740.47	
Gilfillan Trust Fund.....	318	17,164.00	53.96		9	31	278	6,446.40*	
E. M. and E. R. Johnson Foundation Loan Fund.....	25	928.00	37.12			1	24	118.12	
Lambda Alpha Psi Loan Fund.....	4	250.00	62.50			1	3	250.00	
Law Alumni Loan Fund.....	8	494.00	61.75			1	7	312.51	
Lind Fund for the Aid of Deserving Crippled Children.....	9	413.00	45.88				9	1,029.80	
F. D. Lindquist Loan Fund.....	1	55.00	55.00				1	296.21	
Ludden Estate Loan Fund.....	49	2,200.00	42.85				4	1,216.03*	
Ludden Real Estate Loan Fund.....	223	11,597.00	52.00	1	6	21	195	4,700.25*	
Ludden Trust Fund.....	71	4,935.20	69.50			7	7	4,054.35*	
First National Bank of St. Paul Loan Fund.....	9	521.00	57.88		1	2	6	23.39	
Minn. Grand Army of the Repub. and Women's Rel. Corps Loan Fund								200.00	
Minnesota State Organization for Public Health Nursing Loan Fund	3	120.00	40.00				3	11.47	
Dr. Nellie Welch Nelson Home Economics Student Loan Fund.....	21	896.00	42.66				1	20	859.10
Professional Sorority Council Loan Fund.....								133.40	
Ramsey County Medical Auxiliary Loan Fund.....								300.00	
Juniata Shepperd Loan Fund.....	1	25.00	25.00				1	110.99	
Sigma Alpha Mu Loan Fund.....								50.00	
Women's Christian Temperance Union (8th Ward) Loan Fund.....								109.35	
Women's Auxiliary of Minneapolis Dist. Dental Society Loan Fund..	2	86.00	43.00				2	223.52	
Total 1929-30.....	862	\$46,578.20	\$54.03	2	35	77	748	\$26,473.83	
Total 1928-29.....	870	45,711.32	42.15	3	45	68	754	21,076.20	
Total 1927-28.....	742	36,197.45	49.28	3	14	30	695	11,834.73	
Total 1926-27.....	754	37,526.75	49.77	5	23	28	698	4,558.02	

* Includes temporarily invested funds available for loans.

COMPLETE REPORT OF COMPTROLLER

The complete *Comptroller's Report* is published and available for general distribution as Volume XXXIII, No. 48, of the University of Minnesota Bulletin Series.

REPORTS OF ADMINISTRATIVE OFFICERS

HONOR POINT SYSTEM

Frequent references to the honor point system are made in the following reports of administrative officers. The facts here given are, therefore, of general application.

The purpose of this system is to give greater recognition to the higher orders of scholastic achievement. Two factors are employed: a provision that the higher marks shall count more than the lower and a requirement, for promotion and graduation, of a certain average mark in a student's entire work. This plan enables the student to profit by the higher marks received in those studies for which he has the greater aptitude.

Each credit in a course carries three honor points for a mark of A, two for a mark of B, one for a mark of C, none for a mark of D, and minus one for a mark of F. The requirement of satisfactory work is that the student shall secure an average of one honor point (equivalent to a mark of C) in all the studies carried. (When this system was adopted in the College of Science, Literature, and the Arts, in 1914-15, along with the letter-grading system, it was an exact translation of a rule of many years standing in that college which required for graduation a grade of "good" in half of the student's work.)

The honor point ratio is employed as the simplest expression of relative scholastic standing. The ratio is obtained by dividing the algebraic sum of the honor points secured by the number of credit hours of work carried. Thus if a student carries five three-credit courses and receives three B's, one C, and one F, the sum of his honor points is eighteen and his honor point ratio is 1.20.

THE COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

To the President of the University:

SIR: I submit herewith my report as dean of the College of Science, Literature, and the Arts for the years 1928-29 and 1929-30.

Some significant trends in student enrolment will be apparent to one who studies the statistics given by the registrar in his report. During the six years beginning with 1924-25 the growth in the number of students entering the college directly from high schools reached a peak in 1926-27 and, in the past three years, has decreased somewhat. The gain in total enrolment has been somewhat slowed down but still continues. The significant fact is that this gain in total enrolment has come to be dependent chiefly on the proportion of survival. In the six-year period mentioned the number of degrees conferred has increased 28 per cent. (This includes thirty-two degrees the administration of which has been transferred to the Medical School in 1929-30.) The number of juniors and seniors shows a gain of 25, sophomores of 38, and freshmen of 18 per cent. The large gain in sophomores is due to at least three factors: the survival of freshmen, the addition of students transferring from other institutions, and the continuance with sophomore standing of some students who fail to meet the requirements for admission to the senior college or the professional schools. The majority of transfer students enter as sophomores and this helps to make the sophomore class considerably larger than the freshman class. The increase of 24 per cent in transfer students accounts for about one eighth of the gain in sophomores. Since there has been no reduction in the number of students going from this college to the professional schools it is clear that the increase in total enrolment in the college is due chiefly to the higher rate of survival. This is explained in part by the better selection at entrance and in part by the more efficient methods of advising in the freshman year. The mortality is much greater among the transfer students than among those who enter as freshmen. Since the transfer students have their habitudes relatively fixed before they enter, our most serious problem is with the terms of admission of these students.

During the past two years the college has introduced the principle of determining the curricula of students with reference to the abilities and plans of each individual. The desirability of proving differential curricula related to the needs and capacities of individual students was discussed by the writer in 1924 in a paper read before the Association of American Universities. The execution of this plan requires both a modification of our regulations governing the election of studies and a system of advising students before entrance.

The justification for the college reaching out to attempt to guide its prospective students is found in two facts, the mortality among our students in past years and the large number of high school graduates of excellent ability who do not go to college anywhere. In past years about 30 per cent of our freshmen have dropped out before reaching the sophomore year and another 20 per cent before reaching the junior year or a profes-

sional school. Apparently from 30 to 40 per cent of our freshmen have been unable or unfitted to do college work. On the other hand, among those who stand in the highest one fifth of the graduating classes in the high schools the number who do not go to college anywhere is probably greater than the number of graduates from this college year by year.

As methods of distinguishing between the more and the less promising students have been developed in the last ten years we are in a position to give advice before entrance which is of real value to the young men and women concerned. Through the co-operation of practically all the high schools of the state it is now possible for any high school graduate to obtain through his principal a rating of his aptitude for college work. This rating is based upon his rank in his high school class and his rank in the psychological tests given in the high schools in February or March under the direction of this college. This rating is furnished to the high school principals and in addition a small pamphlet discussing "Who Should Go to College" is distributed to high school seniors who are interested. The degree to which the college aptitude rating differentiates between the more and the less promising students makes this a convenient and dependable guide to the student in making his decision. Whereas almost all of those who stand at the highest level in the rating scale do satisfactory work in college, the percentage of successes in the lower half of the scale rapidly diminishes. If the student has a rating between 36 and 50 his chance of success in college is about one in six. If his rating is between 26 and 35 his chance is less than one in ten, while if his rating is not above 25 he has only one chance in one hundred. Of all the students who do satisfactory work 89.4 per cent come from the upper half of the college aptitude rating scale, whereas only 10.6 per cent come from the lower half. Of all the satisfactory students 99 per cent have ratings above 30. Most high school principals give this information to their students together with their own advice. It is for the guidance of those in the middle groups whose ratings leave their prospects uncertain that the arrangements here described are designed.

Additional information about prospective students comes to us in an application for admission which has been used in these two years. In this blank the student gives information about himself—his interests and experience, his reading, his financial circumstances, the education of his parents and of older brothers and sisters—while his principal or faculty adviser gives an estimate of his personal traits which bear upon his prospects of success in further intellectual effort. Finally, from English training tests given at the same time as the psychological tests and from an essay written by the student we gain evidence as to the preparation of the student to pursue work in college English.

In view of all this information each student who sends in an application for admission is promptly sent a letter of advice telling him what courses of study are open to him and offering him such special helps as seem to fit this case. These include assignment to a faculty counselor, enrolment in the course in "How to Study," help in finding employment if he needs it, and so on.

The courses of study for freshmen have been divided into two groups, those open to all and those which are open only to students whose college aptitude ratings indicate that a fair percentage of them will do satisfactory work. For the most part the courses open to all have been selected from the usual offerings for freshmen but for greater convenience and economy in operation one of two general survey courses have been arranged and some lecture courses in science have been made independent of the laboratory work. Students who show very low promise of success are admitted only as non-candidates for a degree. The courses offered to these students are general informational, cultural, or vocational in character. On the other hand, these students are denied entrance to technical courses and those which are to be used as tools in advanced studies. These include foreign languages, laboratory courses, and those courses in any subject which are intended as specific introductions or training courses for those who wish to pursue intensive studies in the given field. The studies which are open to all are believed to be of greater value to young people who will remain only a short time in college and then enter some of the ordinary occupations. The teachers of freshmen are not allowed to know the ratings or classification of their students. The classes, being open to all, may include in their enrolment all grades of ability, so that proper college standards may be maintained. Students with two ratings who demonstrate their ability to do satisfactory work in these courses are thereafter accepted as candidates for a degree and expected to enroll for the required courses.

Aside from this classification of students with regard to general college aptitude, any student who enters foreign languages, mathematics or English is classified by means of placement tests and in some cases the class work of the first week or two weeks. Of two students who have had two years of work in a language in high school, one because of his aptitude and liking for the study may have done well in it and may be ready to go on with the usual continuation course, while the other may have secured so little from his study that it will be better for him to take a lower course and improve his foundation before going on. The same principle holds in mathematics and English and the classification of students in these subjects according to their apparent abilities is a service of the greatest help to many.

When students arrive at the University they find provision for guidance in almost all situations through the Educational Guidance Committee of Freshman Week, the advisers for study program, the group of faculty counselors, the advisers for students on probation under the direction of the Students' Work Committee, and the instructors in charge of the course in How To Study. All students are offered advisers for their study programs and about one third of the freshmen come into the hands of the faculty counselors. Through the activities of all these groups we are reaching more or less effectively nearly all the students who need individual guidance.

The offering of differential treatment does not stop with the provision for newly entering students. Capable and deserving students may always secure consideration of their special circumstances or needs. Students of unusual ability are given special privileges as to advanced courses of study

or modification of the usual requirements. Several departments have offered honors courses for limited groups of superior students. For the proper development of this type of work we must await further funds.

In order to make the principle of individual guidance and service operative to its full extent much more must be done to enable faculty and administrative officers to gain the understanding of individuals on which intelligent action can be based. One of the most useful means to this end would be the application to social studies and literatures of the general type of procedure known as laboratory work in the natural sciences. This would mean close contact and co-operation between instructors and students during the study hours when the students are actually doing their work. Intelligent direction of students' work—not spoon-feeding or supervision suitable for children—would enable each student to gain a clearer understanding of the attitude and significance of the authorities read, a wider range of reading and more complete grasp of the subjects dealt with from week to week, a securer basis for the interpretation of social movements and the solution of problems, and a more critical attitude and more mature judgment than is possible under the prevailing system of references to be read in preparation for quizzes or examinations. All arrangements have been made for the introduction of this type of direction of study in the orientation course next year. The class will be divided into two parts, one to be conducted on the new plan and one as in the past, and the results in the two divisions will be compared.

On the basis of our experience in the past two years further steps are being taken in relation to the class entering in the fall of 1930. An effort is being made to induce a larger proportion of prospective freshmen to make their applications early in the summer so that our advice will be more effective in helping them to plan their work. A somewhat smaller number than heretofore will be required to make their elections from the informational and vocational studies above described, and this smaller number will be put on probation at entrance. In this status they will come at once into the hands of the special advisers working with the Students' Work Committee whose business it is to analyze the difficulties of probation students and see whether they can be helped to overcome their handicaps. Of this group not more than 1 per cent have done satisfactory work in the past.

A second group of students, up to the level at which about 15 per cent do satisfactory work, will be advised to elect studies which will be of immediate use to them and to postpone the more technical requirements for degrees until they see whether they need them. This group of students will also have the help of advisers until they have shown where their abilities lie and are placed to their advantage.

In all these efforts the aim of the college is to make the resources furnished it yield the greatest returns to the state and by its supervision of individual students as far as possible to hold open the door of opportunity for all.

Respectfully submitted,
J. B. JOHNSTON, *Dean*

THE COLLEGE OF ENGINEERING AND ARCHITECTURE

To the President of the University:

SIR: I have the honor to submit my report for the College of Engineering and Architecture for the years 1928-29 and 1929-30.

INCREASING ENROLMENT DEMANDS ADDITIONAL STAFF

There has been the usual increase in attendance, amounting to about 100 students in the fall quarter per year. While this increase for a single year may not seem large, the fact that it is cumulative makes corresponding additions to the teaching staff of prime necessity if the quality of instruction is to be maintained. Moreover, the complicated character of high school instruction and the multitude of outside activities which seem to engulf the high school student apparently result to some extent in a lowered degree of individual effort and ability to apply himself to intensive study in the University. This places a still greater burden upon the teacher to give more attention, if possible, to the individual student, and to do this, his classes should be smaller, not larger. For both reasons, additional teachers are needed.

AMOUNT OF INSTRUCTION*

Year	Total Enrolments	Student Quarter Credits
1927-28.....	16,488	49,740
1928-29.....	17,561	53,058
1929-30.....	18,645	55,283

* Previous Summer Session is included in each case.

FIRST GRADUATES FROM NEW COURSES

In June, 1930, the first classes graduated from the courses in aeronautical and agricultural engineering, four and two students, respectively. The enrolment in aeronautical engineering has grown very rapidly since the course was established two years ago, so that in number of students this department ranks with the oldest departments of civil and mechanical engineering. It is not unlikely that an adjustment or stabilization will occur within a few years, but this may not affect student enrolments any more than that which occurred in the earlier years of electrical engineering.

FLIGHT TRAINING FOR AERONAUTICAL ENGINEERS

For this first class of graduates in aeronautical engineering, there was established a course in practical flying which is regarded as very significant. It is the first course of the kind to be carried out in connection with, and as an inherent part of, a course in aeronautical engineering, at least in the United States. It is very important that the aeronautical engineer

know from actual experience how aircraft behave under rapidly changing conditions and corresponding elements of control. The man who has learned to pilot an airplane has a great advantage over one who does not possess that ability and experience. It is hoped that this training will be available for each senior class in aeronautical engineering.

ALUMNI ORGANIZATION

In connection with Engineers' Day, May 16, 1930, an alumni-faculty dinner was held at the Minnesota Union for the College of Engineering and Architecture and the School of Chemistry, the principal speaker being Mr. Roy V. Wright, '98 Mechanical, editor of *Railway Age*. President Coffman and the dean made short addresses. A new organization of these alumni was effected and officers were elected. The last preceding meeting had been in April, 1920, ten years ago. The renewed interest on the part of the alumni is indicative of a closer relationship in the future.

Respectfully submitted,

O. M. LELAND, *Dean*

THE SCHOOL OF CHEMISTRY

To the President of the University:

SIR: I have the honor to submit my report for the School of Chemistry for the years 1928-29 and 1929-30.

AMOUNT OF INSTRUCTION*

Year	Enrolments	Student Quarter Credits
1927-28.....	6,366	27,016
1928-29.....	6,716	28,635
1929-30.....	6,928	28,714

* Previous Summer Session is included in each case.

AMERICAN CHEMICAL SOCIETY CONVENTION

A most noteworthy event for the School of Chemistry was the annual meeting of the American Chemical Society held in Minneapolis in September, 1929. The School of Chemistry was the center of activities at the University. The scientific sessions were held on the campus in eighteen various divisions. About 1,200 members were in attendance. The number of distinguished foreign visitors included Professor Max Bodenstein of Berlin, Dr. Francis Perrin of Paris, and Professor A. E. Chichibabin of Moscow. An outstanding contribution to chemistry was the address of Dr. K. Bonhoeffer of Berlin, who reported and demonstrated a new form of molecular hydrogen. The Priestley medal of the society was presented to Francis P. Garvan of New York for distinguished service to chemistry. President Irving Langmuir made the award and delivered his retiring address on the subject "Modern Concepts in Physics and Their Relation to Chemistry."

CHEMICAL SYMPOSIUM

During the second Summer Session in August, 1929, a Symposium on Chemical Activation was held in the School of Chemistry. This was the first national symposium held in the School of Chemistry since the Colloid Symposium in 1925. The visiting lecturers were Professor Hugh S. Taylor of Princeton University and Professor M. Polanyi of the University of Berlin. The resident lecturer was Dr. S. C. Lind.

Respectfully submitted,

O. M. LELAND, *Dean*

THE DEPARTMENT OF AGRICULTURE

To the President of the University:

SIR: For nearly ten years the agricultural situation in the United States has been a topic of lively daily discussion. Attention has been called repeatedly to the unfavorable economic position of agriculture and to the economic distress of farmers. Scores of suggestions have been brought forward for farm relief, most of which have been in the form of proposals for state or national legislation. Political parties and candidates for major state and national offices have been obliged to declare their position relative to "farm relief," and the term has been emphasized and re-emphasized so much that it has become very commonplace and trite.

Gradually the people whose major interests are in agriculture have come to realize that the industry is passing through not only a period of economic readjustment but a period of revolution as well. Even those who display the largest measure of faith in the potency of legislation in solving the farmer's problem are beginning to see that the farmer must contend with forces and movements that profoundly affect his economic and social life and to which no legislative cure can be applied. They are beginning to comprehend the effect extreme industrialization, prodigious urban growth, and unprecedented development in rapid communication and transportation may have on agriculture and on the man who lives on the land. In fact, not only those who have expressed faith in legislative relief, but all who have tried to inform themselves about the agricultural situation have come to realize how difficult and complex are the problems surrounding agriculture.

Therefore, as the study of the agricultural situation continues, as such agencies as the Federal Farm Board attempt to better the situation by aiding in the improvement of conditions surrounding the production and distribution of agricultural products, there develops a more deep-seated conviction as to the need of highly trained men and women who shall be engaged both in the pursuit of agriculture and in the solution of the biological, economic, and social problems with which those engaged in agriculture must contend. As a result there is an increasing interest in agricultural education and research. As evidence of this, farmers in greater numbers are turning to the experiment station for types of information which can be secured only by research, and increasing numbers are availing themselves of the program of education in the agricultural extension service.

THE COLLEGE

The registration figures for the college (given elsewhere in this report) show a steady and substantial increase in college attendance. For the year 1929-30 this increase over the preceding year has been about 8 per cent and the college registration is now the largest in its history, totaling almost one thousand students (979). Home Economics has maintained the steady

increase it has enjoyed for the last five years and contains about half of the students of the college. Forestry has apparently reached a temporary maximum, showing a slight decrease in the present year. Agriculture has had a gratifying increase in both years of the biennium, reflecting a returning confidence in the agricultural future. At least a part of this increase is to be ascribed to the demands and opportunities for specialists in various fields of agricultural work.

No radical changes in the curriculum of the college have been made recently. The co-operative course with the College of Engineering and Architecture leading to the technical degree in agricultural engineering, has now been in operation for four years and two students completed the work this year. A readjustment of the co-operative course with the School of Business Administration and dealing with courses in the field of agricultural business administration has been completed. The curriculum as a whole permits of a wide latitude for students who desire special fields of training and continues to offer various standardized courses for technical agriculture in its various phases. Progress has been made in improving the fundamental work which is offered to those students interested in fur farming. In the field of home economics there seems to be an increase among those who are interested in institutional management, altho the teacher's course is still the predominant one. In forestry also there is evidence of an increasing interest in the special fields of science in its relation to forestry.

It seems to be obvious from the trend in recent years that in practically all three of the fields of the college, specialization is becoming more and more important. The opportunities open to those who make special preparation for some particular line of work are increasing very rapidly. Each of the three fields is so large that the various occupations and professions involved in these fields demand specialization, particularly along the line of the sciences that contribute to these fields. The demand for specialists is not merely that which arises in other educational institutions but also in the industries associated with these fields. Some of this specialization requires advanced work in the Graduate School. It is probable that the number of students in the various fields of the college who will elect to follow special lines will continue to increase.

There has been a very noticeable increase in the demands of industrial organizations and private and public enterprises associated with the fields of agriculture, forestry, and home economics. They are more and more turning to the colleges for young men to be taken into such industries and enterprises. A more healthy understanding is appearing in these organizations as to the possibilities as well as the limitations of college graduates. These organizations are becoming aware of individual differences and of the fact that graduates must usually have periods of apprenticeship in any new industry before they can use to their fullest extent the training received in college. It is also a noticeable fact that many of these students entering industrial organizations are making valuable contributions to the field of agriculture.

This college has worked for a number of years in an attempt to develop the best possible state policy in co-operating with the junior colleges of the state. The junior colleges are organized for the purpose of giving the first two years of university work near the home of the student where he can obtain the basic sciences and other subjects necessary for his college course at least expense. Particularly in the field of agriculture and forestry it is very difficult and seems highly undesirable for such junior colleges to attempt to develop any considerable amount, if any, of the technical work in agriculture or forestry. The expense of maintaining lands, herds, and flocks, and other equipment would be entirely disproportionate to the value and to the number of students interested. In order, therefore, to assist students in these junior colleges in completing technical courses in forestry and agriculture in our college, we have made certain concessions and arrangements with the junior colleges which seem to be working out very satisfactorily. Students completing two years in these junior colleges, if they have normal ability and industry, can usually complete the standard courses in our college in an additional two years. This will depend, however, on their taking the recommended sciences and other subjects in their first two years in the junior college. We have encouraged this policy and assisted the junior colleges in every way possible. The co-operation has an additional value in that it permits our college to concentrate, as far as these students are concerned, on the technical work in their fields. In the field of home economics a limited amount of home economics subjects is given in most of the junior colleges. The number of transfers from such colleges and other colleges is large in home economics and is increasing in forestry and agriculture. There still remains a considerable difficulty in arranging co-operation with the denominational colleges of the state and this problem can only be worked out gradually. We have had the most cordial relations, however, with these institutions and are doing all we can to assist any of their students who desire to obtain training in the fields of our college to do so without loss of time.

There seems to be no considerable change in the personnel of the student body unless it is that common to the student bodies of all colleges and to the youth of today. It would appear that they are increasing in the ability to carry on their own affairs and in their capacity for organization. Perhaps they are merely a little more mature for their age or perhaps again it is merely greater sophistication. There is a great deal of serious thought among them, especially in connection with their greater understanding in preparation for special fields of work. No detailed study has been made of the comparative intelligence of the students in this college with those of other colleges. There is a general impression among many members of the faculty that the quality, however, is steadily increasing. The 4-H Club work, other types of boys' and girls' club work, and personnel work in the high schools of the Twin Cities seem to be having a very useful result in this connection. The ability of many, if not most, of the 4-H Club members in organizing and handling student affairs is a noticeable feature.

Perhaps the most outstanding difficulty in connection with the student body as a whole is the old one of financial need. A large number of students earn at least a part of their way through college. Many of them earn their whole way. This is a very difficult matter, especially for girls. When it can be successfully done it is often a valuable experience, but many students of only normal ability, and especially those with less than normal ability, are unable to carry the financial load as well as their college subjects. The college does everything in its power to assist these students, but the number is too large to make assistance in every case effective. It should be pointed out that these students make a real contribution to the college in their industrious habits and in the seriousness of purpose which they exhibit, which improve the attitudes of the student body as a whole. It is a noticeable fact, also, that the student body of this college is more and more taking an active part in the student affairs of the whole University.

The morale in the faculty remains gratifyingly high. There is quite evident a sincere desire on the part of faculty members and especially the student advisers to assist every student in making the most of his college course. The college contacts of faculty and students are close and anything but cordial relationships are exceptional. It must not be inferred from this that the advisory system of the guidance of students even approximates the ideal. Indeed, the question of advising students is one of increasing importance and difficulty because of the large numbers of students and of the many other duties of members of the faculty. Since the college has been conscientiously attempting to provide each student with the best professional and cultural training suitable to that student, the organization of advisers becomes highly important. The time does not seem far distant when this phase of college administration will need to be given greater emphasis, stronger support financially, and in some cases definite assignment of faculty members for advisership duty.

SCHOOLS

The school at University Farm suffered a great loss in the death of Professor D. D. Mayne who passed away December 14, 1929. He had served as principal of the school faithfully and with distinction for over a quarter of a century. During this time he made outstanding contributions to the type of education peculiar to the schools of agriculture in Minnesota.

During the biennium there was a pronounced increase in the enrolment at all the schools. Both the Crookston and Morris institutions attained larger attendance than ever before in their history, and the enrolment of regular students at University Farm was larger in 1929-30 than in any preceding year since 1916.

The regular courses in the schools of agriculture extend over a period of six months in each year for three years. During the biennium larger numbers of students than ever before attended for an additional year. A fairly large number of these four-year students qualified for entrance in the College of Agriculture. In fact, the schools of agriculture are becoming increasingly important as a source from which agricultural college students are being drawn. As a rule the graduates of the schools who

enter the college prove to be superior students, and upon college graduation, they usually make good in some profession closely related to agriculture.

During the biennium increasing numbers of high school graduates attended the schools of agriculture. The schools are becoming attractive to young men of high school experience who wish to have a special training in order that they may be better qualified for farming, but who do not care to spend four years in college.

In the two years under review there was an increase in the number of former and active 4-H Club members who registered in the schools. This was indicative not only of hearty co-operation between the schools and the extension service, but also of the influence of the extension service in awakening interest amongst country boys and girls in education beyond the grades. After all, only a small fraction of a per cent of those eligible to attend the schools do attend. There is a great host of young people in the state who are planning to live in the country and farm. They are greatly in need of more educational training than they can receive in the grades. They should be persuaded to avail themselves of the facilities of high schools and the schools of agriculture. Those who can afford it should not stop short of graduation from the College of Agriculture.

THE EXPERIMENT STATION

The demands on the Experiment Station for assistance in the solution of agricultural problems are steadily increasing. The nature of the information requested is becoming more exacting and technical. To meet these demands it is necessary to maintain a staff of high scientific training and attainments and to provide those engaged in research with suitable and adequate laboratory facilities. The agricultural problems are becoming more and more complex and the day is past when any one research worker, no matter how well trained, can adequately investigate a problem in all of its ramifications. The effort therefore in the organization of experiment station work is to bring into close co-operative relations all of those who can in any way contribute to the solution of the problem. The work is thus organized around projects rather than around men with the expectation that each worker will contribute to some phase of the investigation and assist in working out the solution of the whole problem. In this respect the Minnesota Experiment Station has made significant progress and a new policy of research procedure is being developed on a sound and healthy basis. The divisions of the Experiment Station are co-operating in a whole-hearted manner and wholesome relations have been established with the branch stations, thus extending the opportunity for securing data and bringing in to the investigations all of the facilities of the University.

The ready acceptance of the findings of the staff, coupled with the demand for more assistance, indicates that the Experiment Station is meeting its responsibilities in a satisfactory manner. There are, however, many important problems still deserving attention that cannot be undertaken at this time without laying aside researches under way but still unfinished. The economic adjustments now taking place in the agricultural industry are forcing to the front many new fields of investigation. Changes

in transportation, in methods of marketing, and in the scale of production are bringing many new problems to the farmer. New industries are coming into existence, new forms of production should be developed, and attempts should be made to find new uses for old products. These are all fields of investigation capable of yielding important results. Up to the present time it has not been possible to undertake investigations in these fields, desirable tho they may be. More than one hundred requests for additional research have been filed during the last year that must wait for the completion of work in hand or for additional financial support.

The staff of the Experiment Station has been productive throughout the biennium. As measured by publications and quality of result, it ranks with the best in the country. During the period there have been published 22 bulletins in the regular Experiment Station Series, 12 bulletins in the Technical Series, 26 bulletins in the Special Series, 2 annual reports, and 98 papers in the Scientific Journal Series. Papers published in the Scientific Journal Series are based on the researches of the Experiment Station. These papers are published in this series to save expense to the University and to secure the earliest possible distribution of significant research results.

On the whole, the work of the Experiment Station is moving forward in a satisfactory manner. The research work of the Poultry Division has been perfected and expanded, and important investigations have been initiated in the field of honey production. Comprehensive investigations have been established covering the field of mineral deficiency in livestock feeding and a thoro investigation has also been initiated covering the relation of mineral deficiencies to disease. Physiological and chemical studies of the blood serum in bovines have led to the discovery of a new and effective treatment for milk fever that is being adopted in veterinary practice. Investigations in the development of disease resistant crops have been expanded somewhat in consequence of the special legislative appropriation for the purpose made by the last legislature. All phases of the crop improvement program are moving steadily forward with the result that many new varieties of cereal crops and of horticultural crops are being developed for commercial production.

Since high quality of research is called for by present day conditions, men of the highest scientific training are required for leadership in the major phases of research. Such men are so much in demand that increased financial support for the Experiment Station is necessary to secure them and to provide them with the kind of equipment which is constantly being devised as an indispensable adjunct to the highest type of modern scientific research.

AGRICULTURAL EXTENSION

ADMINISTRATION

The administrative policies in the Division of Agricultural Extension have been essentially the same during the biennium as they have been for the past ten years. A more complete understanding of the policies of administration by all members of the staff has increased the effectiveness of the supervision to a marked degree. Frequent discussion of personnel prob-

lems, policies of supervision, methods of preparing project material, and methods of field teaching have brought about better administrative relations with all workers in the division. Conference meetings have been held twice each month with the result that a strong staff morale has been developed and a better balanced extension program obtained than would have been the case if the workers had not been brought together for frequent discussion of their problems.

The relations of the agricultural extension service and the educational institutions and departments of the state have been closer and more satisfactory than in former years. Particular reference is made to the Smith-Hughes and other high schools of the state; to the offices of county superintendents of instruction, and to the State Department of Education. For example, the county agents have tended to develop their 4-H Club programs with the assistance of school teachers and county superintendents of schools. The Smith-Hughes teachers have co-operated to the end that the programs of both Smith-Lever and Smith-Hughes agencies have been closely coordinated and the two types of programs and methods of work well understood. In 1928, for the first time, the Smith-Hughes teachers assembled at the district conferences with county agents to discuss problems of mutual interest. Likewise members of the extension staff have contributed towards the discussions in the district conferences held by the Smith-Hughes forces.

The relationships with the State Department of Agriculture, the State Forest Service, the State Livestock Sanitary Board, the State Agricultural Society, the State Bankers Association, the County Federation of Fairs, and similar organizations of a public and semi-public nature have been close and satisfactory. The same statement may be made concerning relations with livestock breeders' associations, crop improvement associations, various commodity co-operatives and the State Farm Bureau Federation.

FINANCES

There were four sources of funds making up the total budget for agricultural extension work. Of the total amount the Federal Government contributed 39.5 per cent; the state 26.5 per cent; the counties 28 per cent, and the county farm bureaus 6 per cent.

STATEMENT OF AGRICULTURAL EXTENSION FUNDS

	1928-29	1929-30
State Extension fund 24.....	\$ 50,000	\$ 50,000
Federal Smith-Lever fund 04	116,539	116,539
Federal Supply Smith-Lever Fund 05	40,927	40,927
Federal Capper-Ketcham funds 07	20,000	32,951
State County Extension Agent fund 25.....	85,775	86,000
Federal U.S.D.A. funds (paid direct).....	12,800	12,800
Federal Clark-McNarry funds (paid direct).....	1,980	1,980
Appropriated by county commissioners	147,598	144,876
Farm Bureau and other local funds.....	24,521	34,930
Totals	\$500,140	\$521,003

PERSONNEL

The following list gives the personnel employed in the agricultural extension service during the past two years.

1928-29

23 men, 8 women full time
 11 men, 1 woman part time—15 full time clerical—5 part time
 65 county agents
 5 home demonstration agents
 3 club agents (full time)
 22 club agents (part time)

1929-30

24 men, 10 women full time
 9 men, 3 women part time—11 full time clerical—4 part time
 66 county agents
 3 assistant county agents in charge of club work
 10 county home demonstration agents
 3 urban home demonstration agents
 3 county club agents (full time)
 29 club agents (part time)

SUMMARY OF WORK BY SECTIONS

County Agent Work

The record of achievements as pictured by the annual reports of the agricultural agents becomes more impressive each year. The significance of work done does not lie wholly or particularly in the quantitative measure of accomplishments but rather in the rate of progress made, amount and quality of leadership developed, and the relative amount of ground broken each year for further development in the future.

The total number of separate extension contacts made during each of the years covered by this report was approximately one and one-half millions. These contacts were in the form of telephone calls, office calls, official farm visits, correspondence dealing with farm, home, and community subjects, and specific services rendered to individuals and groups under the separate projects making up the county programs. The number of contacts increased approximately 10 per cent each year for the past five years.

An analysis of the various types of activities that contribute toward the total number of contacts yields specific and very impressive statistical results as follows: The volunteer leadership that has played such an important part in the development of the extension program increased year by year. In 1928 there were 4,600 adult voluntary leaders and 1,100 junior voluntary leaders assisting the agents in carrying on the program of work. In 1929 these numbers had increased to 6,158 adult leaders and 1,637 junior voluntary leaders. In the organized farm bureau units and farmers' clubs there were 25,000 men and 20,000 women enrolled in 1928. Approximately the same numbers were enrolled in 1929. The number of farm visits increased from 35,000 to almost 40,000 during the two years; the office calls, from 140,000 to 157,000; and the telephone calls from approximately 100,000 to 107,460. These increases in types of activities approximated the pro-

portionate increases in the subject-matter projects and in the general operation of the field service. This means that each year added to the number of people interested in the phases of adult education sponsored by agricultural extension and indicates a growing favorable public attitude toward this type of the University's educational service.

The leading subject-matter lines developed with the county agents and specialists in the agricultural projects were dairying, swine, beef cattle, sheep, poultry, livestock diseases, field crops, plant diseases, farm management, marketing, soil, and forestry. In dealing with these lines major emphasis was placed upon economical dairy production, swine management and sanitation, livestock diseases, and economic work in farm management and co-operative marketing.

Home Demonstration Work

In 1928-29 the extension service maintained six county rural home demonstration agents and three urban agents. In 1929-30 the number of county rural home demonstration agents was increased to ten with no change in the number of urban workers.

The record of achievement in the principal projects, namely, clothing, nutrition, home management, home poultry, and child development was greater than in 1928 partly because of the assistance given by the increased number of home demonstration agents but more particularly because of the added interest shown by groups of farm women in the programs of work. The attitude of the county agents toward the development of the home project part of their program was also favorable to an increase in this phase of the extension service. The following statistical summary for 1929-30 which illustrates the principal activities of specialists in the home project work is given as an indication of the number of farm women reached under a leadership developed by an intensive system of training local leaders.

Project*	No. Counties Reached	No. Women Enrolled	Per Cent Completing	Total Women Reached	Improved Practices Adopted
Nutrition	13	2,008	85	10,122	6,485
Clothing (2)	15	4,163	88	18,914	21,767
Home Management ..	9	2,234	93	12,806	9,465
Poultry	17	1,409	75	3,414	3,073

* Child development project started August 1, 1929.

Boys' and Girls' Club Work

One of the outstanding factors in the 4-H Club program is an attempt on the part of the supervisors of the club projects to emphasize permanency of results rather than large increases in enrolments. Large enrolments are usually accompanied by spectacular publicity on the part of local leaders who, in the light of local records being made, become enthusiastic over the possibilities. In order that quality of results may be stimulated and per-

manency of the project work insured it is very necessary to put the proper brakes on those who become overenthusiastic.

In 1928 the final records indicated a total enrolment of 32,045 club members, and in 1929 a total of 37,209—an increase of approximately 16 per cent. In 1928 the final record showed 24,271 finishing the year's work, while in 1929 the total finishing was 29,308—an increase of 20 per cent, which is net gain over the last two years. The number of completions represented 78 per cent of the number enrolled, which was very close to the record of that reported two years ago. Fifty-six per cent of the enrolment was girls, which has been the approximate proportion of girls to boys in the club work for a number of years past.

Local business interests and the large city business interests continued with the fine co-operation in the 4-H Club work that has been so much in evidence during the past decade. The farm bureaus, the State Farm Bureau Federation, the Smith-Lever teachers, the superintendents of schools, the co-operatives, the Livestock Breeders' Association, the various breed associations, the Twin City papers, the railroads, the South St. Paul livestock interests—in fact, every type of commercial and educational organization strongly backed the club program and was anxious to be of any possible service in increasing its effectiveness with the boys and girls. The zeal with which this work was supported by business interests leads its administrators to be ultra-conservative and extremely cautious in the consideration of the many offers received, and in the direction of the assistance given. In view of this experience, it is well to point out that some danger exists in too much assistance from commercial interests, and that there is always present the danger of some group attempting to capitalize its co-operation by commercializing the projects and looking upon them as opportunities for advertising commercial products.

SHORT COURSES

The short courses for the years under review and the number registered were as follows:

	1928-29	1929-30
Ice Cream Makers'	18	24
Creamery Operators'	60	60
Advanced Creamery Operators'	38	28
Poultry	46	63
Farmers' and Homemakers'	1902	1914
Horticulture	166	226
Regional Scout Seminar	30	34
Editors'	184	206
Fur Farmers'	106	...
Forestry, Woodcraft, and Scouting.....	56	32
Beekeepers'	0	10
Land Management	0	86
Milk Control Officials'	0	23
Boys' and Girls'	825	975

The interest in short courses continued unabated. A few of the many requests involving additional short course instruction were granted but only those which seemed to warrant the necessary expenditure of money and effort.

The Land Valuation Short Course, a new undertaking, seemed to fill a need on the part of persons and institutions that were holding large areas of farm land for which values were fluctuating and uncertain. Special emphasis was placed upon those characteristics, particularly controllable, which affect the real value, as well as the market price, of farm lands in Minnesota and the Northwest. As a sequence to this, another short course was held in March, 1930, dealing with the questions relating to management of farm lands owned by large holding companies and organizations. The number attending these new courses was gratifying, and the business men of the Northwest interested in farm lands were highly complimentary in their remarks concerning them. A bulletin was published containing the substance of the addresses of the Land Valuation Short Course and one is contemplated that will contain a résumé of the principal features of the Land Management Short Course. The demand for the former was so great that a second printing was necessary.

A third course added gave instruction to those officials of cities and towns responsible for the administration of the laws and practices relating to milk control in Minnesota. The attendance and interest were enough to indicate the desirability of offering a similar one in the near future.

Requests have continued to come in from year to year for a special short course in poultry husbandry, altho instruction in poultry is a feature in the Farmers' and Homemakers' Annual Short Course program. There was offered in the fall of 1928 and again in 1929 a short course relating especially to the culling of flocks, the selection of breeding stock, mating, warding off disease, and hatching and rearing chicks.

Besides conducting short courses, the division acts as a clearing house for arranging dates and programs of miscellaneous gatherings, such as, railroad excursions, conferences, and the visits to University Farm of many different groups, either seeking a knowledge of what the institution is doing or a knowledge of some particular activity in agriculture, forestry, or home economics.

As a barometer of public interest, the short courses indicate a steady and gratifying increase in the favorable attention given by the public to the activities of the University Department of Agriculture as represented at the University Farm Campus.

The belief is doubtless justified that both agriculture and the University enjoy an increasing friendship on the part of the people of the state, a portion of which can be traced to the better acquaintances with the institution through the attendance upon the short course activities.

Respectfully submitted,

W. C. COFFEY, *Dean*

THE LAW SCHOOL

To the President of the University:

SIR: I have the honor to submit the following report on the work of the Law School.

Instead of the usual report on the work of the biennium 1928-30, I propose to state briefly the important developments in legal education in the United States in the past ten years, the progress of our school during this period, and its plans for future development. Particular attention is invited to the last part of the report on the four-year law course, marking as it does a new departure in legal education.

PROGRESS OF LEGAL EDUCATION

Admission to the bar.—The past decade was a period of marked progress in respect to the educational requirements for admission to the bar in the United States. At the beginning of the decade, the requirements for admission to the bar were universally low. In many states no general education was prescribed, and the most required in any state was a high school course. The period of law study was two or three years, and no distinction was made between schools in which students devote all their time to their studies, and schools in which they devote only part time. These requirements were in striking contrast to the demands made upon students seeking admission to other learned professions.

The advance of the present decade is due in large part to the awakened interest of the American Bar Association. In 1920 that association appointed a special committee of prominent lawyers, headed by Elihu Root, to "report recommendations in respect to what, if any, action can be taken to create conditions which would tend to strengthen the character and improve the efficiency of those admitted to the practice of the law."

The committee reported the following resolutions:

(1) The American Bar Association is of the opinion that every candidate for admission to the Bar shall give evidence of graduation from a law school complying with the following standards:

(a) It shall require as a condition of admission at least two years of study in a college.

(b) It shall require its students to pursue a course of three years' duration if they devote substantially all their working time to their studies, and a longer course, equivalent in the number of working hours, if they devote only part of their working time to their studies.

(c) It shall provide an adequate library available for the use of the students.

(d) It shall have among its teachers a sufficient number giving their entire time to the school to insure actual personal acquaintance and influence with the whole student body.

(2) The American Bar Association is of the opinion that graduation from a law school should not confer the right of admission to the Bar, and that every candidate should be subject to an examination by public authority to determine his fitness.

(3) The Council on Legal Education and Admissions to the Bar is directed to publish from time to time the names of those law schools which comply with the above

standards and of those which do not, and to make such publications available so far as possible to intending law students.

(4) The President of the Association and the Council on Legal Education and Admissions to the Bar, are directed to co-operate with the state and local bar associations to urge upon the duly constituted authorities of the several states the adoption of the above requirements for admission to the Bar.

(5) The Council on Legal Education and Admissions to the Bar is directed to call a Conference on Legal Education in the name of the American Bar Association, to which the State and local bar associations shall be invited to send delegates for the purpose of uniting the bodies represented in an effort to create conditions favorable to the adoption of the principles above set forth.

These resolutions were adopted by the American Bar Association September 1, 1921.

The Conference on Legal Education called for by these resolutions was held in Washington, D.C., February 23, 24, 1922, and was attended by delegates from the American Bar Association, 44 state bar associations, 116 local and foreign associations and 27 law schools. The conference adopted the following statement in regard to legal education:

1. The great complexity of modern legal regulations requires for the proper performance of legal services lawyers of broad general education and thorough training. The legal education which was fairly adequate under simpler economic conditions is inadequate today. It is the duty of the legal profession to strive to create and maintain standards of legal education and rules of admission to the bar which will protect the public both from incompetent legal advisers and from those who would disregard the obligations of professional service. This duty can best be performed by the organized efforts of bar associations.

2. We endorse with the following explanations the standards with respect to admission to the bar, adopted by The American Bar Association on September 1, 1921.

3. Further, we believe that law schools should not be operated as commercial enterprises, and that the compensation of any officer or member of its teaching staff should not depend on the number of students or on the fees received.

4. We agree with The American Bar Association that graduation from a law school should not confer the right of admission to the bar, and that every candidate should be subjected to examination by public authority other than the authority of the law school of which he is a graduate.

5. Since the legal profession has to do with the administration of the law, and since public officials are chosen from its ranks more frequently than from the ranks of any other profession or business, it is essential that the legal profession should not become the monopoly of any economic class.

6. We endorse The American Bar Association's standards for admission to the bar because we are convinced that no such monopoly will result from adopting them. In almost every part of the country a young man of small means can, by energy and perseverance, obtain the college and law school education which the standards require. And we understand that in applying the rule requiring two years of study in a college, educational experience other than that acquired in an American college may, in proper cases, be accepted as satisfying the requirement of the rule, if equivalent to two years of college work.

7. We believe that the adoption of these standards will increase the efficiency and strengthen the character of those coming to the practice of law, and will therefore tend to improve greatly the administration of justice. We therefore urge the bar associations of the several states to draft rules of admission to the bar carrying the standards into effect and to take such action as they may deem advisable to procure their adoption.

8. Whenever any state does not at present afford such educational opportunities to young men of small means as to warrant the immediate adoption of the standards, we urge the bar associations of the state to encourage and help the establishment and

maintenance of good law schools and colleges, so that the standards may become practicable as soon as possible.

9. We believe that adequate intellectual requirements for admission to the bar will not only increase the efficiency of those admitted to practice but will also strengthen their moral character. But we are convinced that high ideals of professional duty must come chiefly from an understanding of the traditions and standards of the bar through study of such traditions and standards and by the personal contact of law students with members of the bar who are marked by a real interest in younger men, a love of their profession and a keen appreciation of the importance of its best traditions. We realize the difficulty of creating this kind of personal contact, especially in large cities; nevertheless, we believe that much can be accomplished by the intelligent co-operation between committees of the bar and law school faculties.

10. We therefore urge courts and bar associations to charge themselves with the duty of devising means for bringing law students in contact with members of the bar from whom they will learn, by example and precept, that admission to the bar is not a mere license to carry on a trade, but that it is an entrance into a profession with honorable traditions of service which they are bound to maintain.

The American Bar Association has since been earnestly engaged in getting their recommendations adopted by the several states. At the present time fourteen states require two years of college work, or its equivalent, in addition to three years of law study. A few of these have extended the period of law study to four years in part time law schools. These standards have met with the approval of the bar, and the movement for their adoption is gaining such momentum that they will probably prevail generally throughout the United States in the not distant future.

In Minnesota, by order of the Supreme Court candidates for admission to the bar who begin their law studies after March, 1931, will be required to obtain credit for two years of college work before beginning the study of law, and to devote three years to the study of law in a day law school or four years in a night law school or law office. This action puts Minnesota in the forefront of the movement for higher standards.

Law schools and registration.—The number of law schools and law school enrolment in the United States continues to increase. In 1919-20 there were 62 day schools with an attendance of 10,532 students, and 84 part time schools with an attendance of 13,971—a total of 146 schools with attendance of 24,503. In 1927-28 there were 76 day schools with an attendance of 15,784 students, and 100 part time schools with an attendance of 32,809 students—a total of 176 law schools and 48,593 students. The ratio of freshmen entering law and medical schools each year appears to be about four to one.

In Minnesota there are two day law schools and four night law schools. Registration reached a maximum of approximately 1,350 students in 1923-24, but it has since decreased each year, and was 962 for 1929-30. The University Law School had exactly the same registration in these two years; the decrease has been wholly in night school attendance. It is interesting to note that while night school attendance rapidly increased in the United States, it has decreased in this state.

Entrance requirements.—Generally the entrance requirements of the part time law schools coincide with the requirements for admission to the bar in their jurisdictions. On the other hand, university law schools have

generally been in advance of bar admission requirements. In 1920, before college work was required for admission to the bar of any state, 31 schools required two or more years of college work for admission. The university law schools have led the way to higher standards, and as the bar admission requirements advance these schools tend to increase their requirements still further. At the present time six law schools require a degree for admission, and thirteen others require three years of college work. That is to say, nineteen schools now require six years or more of study after high school graduation for the bachelor of laws degree.

Since 1910, the University Law School has required two years of college work and three years of law study, or a total of five years, for the bachelor of laws degree. In recent years, many students have voluntarily taken six or seven years of university work, three or four years in the College of Science, Literature, and the Arts, and three years in the Law School. By the recent action of the Board of Regents, a minimum of six years will hereafter be required, the disposition of the additional year will be discussed later in this report.

THE SCHOOL

Physical equipment.—The new Law Building erected in 1927 has now been occupied for over two years, and has proved admirably adapted for its purposes. The law reading room is one of the best in the country, and has caused a considerable increase in the use of the library facilities by the students. The classrooms and practice court room provide much better facilities than have been available in the past. The better physical equipment has probably contributed to the improved scholarship, to which reference will later be made.

Law library.—The stack room in the new building has made the whole library available for the use of the school. In the old building, many books had to be stored and were practically unavailable. In the ten-year period, the volumes in the library have increased from 30,498 to 54,594. Some rare and valuable books have been acquired, which are increasing rapidly in value. The total amount expended on the library for books and binding during the ten-year period was \$99,527.18. Library costs are mounting rapidly. Continuations and binding eat largely into the annual appropriations, and additional sums are necessary to purchase desirable collections. The law library has been well selected and contains comparatively few obsolete volumes. The splendid results that have been achieved with the small amount of money available are a tribute to the energy and business acumen of the librarian. The law library, while not as large as that of a few law schools, ranks comparatively well.

Faculty.—There has been almost no increase in the faculty during the decade. The enlarged program outlined below will necessitate a substantial increase of staff to take care of the new work to be introduced.

In the first five years of the decade, there were considerable losses from the faculty to other law schools. It is a pleasure to report that these losses have ceased. Members of the faculty are still being sought by other law

schools, but the more liberal salaries made available by the Board of Regents, while not equal in amount to the salaries paid by several law schools, have been sufficient, combined with other factors, to keep the faculty intact. The physical equipment and conveniences of the school as well as the somewhat lower cost of living in the state have probably contributed to this result.

Professor Henry J. Fletcher retired at the close of 1928-29 after thirty-four years of service. As teacher, scholar, and editor-in-chief of the *Minnesota Law Review*, he contributed in large measure to the development of the school. His fine personal qualities made a lasting impression on the students, and the bar has been enriched through his influence. The regents appropriately made him professor emeritus. The alumni and students presented an excellent oil portrait of him to the school.

Our present faculty consists of comparatively recent appointees. Only one of the full time teachers was appointed prior to 1917. Most of them are young men. As students they were outstanding in scholarship, generally leading their classes. Several of them have had graduate courses. It has recently been strengthened by two appointments which will be effective next year.

The members of the faculty are contributing in several ways to the activities of the profession. By articles in Minnesota and other state law reviews, they are contributing to the development of the law. They have taken an active part in the progressive movements of the State Bar Association. One was a member and another executive secretary of the State Crime Commission. One has been for several years an adviser to the American Law Institute in Property and Trusts. Others are preparing Minnesota annotations to the restatements of the institute on the request of the State Bar Association. One has edited a casebook on taxation which has been adopted by many law schools.

Student body.—The number of students registered in the school has been fairly stable during the last ten years. The total registration was 269 in 1920-21 and 277 in 1929-30. The maximum registration during the period was 304, and the minimum 269. The school is now sending out from 70 to 80 graduates per year, and is contributing each year about 60 per cent of the persons admitted to the bar in the state. The school has not limited registration, but it does not seek a large attendance. The profession is now overcrowded. A considerable number who used to study law for business purposes now take the course in the School of Business Administration.

Scholarships.—The preparation of students now entering the Law School is very much better than at the beginning of the decade. In the entering class of 1920-21, 20 per cent had three or more years of college work, 41 per cent had two years, and 39 per cent were classed as special students. In the entering class of 1929-30, 57 per cent had three or more years of college work, 41.5 per cent had two years, and 1.5 per cent were classed as special students. The number of special students has constantly diminished during the decade, and the number of more highly trained students

has increased. The student body of the present time is superior to the student body of ten years ago. Its scholarship achievement in the school is materially higher. At the beginning of the decade, scarcely 10 per cent maintained a B average in law work. During the last two years, over 20 per cent have maintained that average. On the other hand, there is unfortunately little change in the percentage of students failing to do satisfactory work, and excluded from the school for that reason.

School status.—There are two agencies for the classification of law schools, the Association of American Law Schools and the Council of Legal Education of the American Bar Association. The Law School has maintained membership in the Association of American Law Schools since it was organized in 1900. This association now consists of 66 out of a total of 178 law schools in the United States. The Council of Legal Education of the American Bar Association classifies schools into "approved" and "not approved." This Law School has been approved since the first classification. It is the only law school in the State of Minnesota which is a member of the association and is approved by the Council on Legal Education.

Our graduates are sought by the postgraduate schools. An increasing number of them are preparing for law teaching. These students generally pursue a postgraduate course in some eastern school. For the coming year, four graduates have received fellowships with stipends of \$1,300 to \$2,500 each for graduate study in Harvard, Columbia, and Yale.

Some of the ablest graduates of the school are now finding positions with leading New York firms. One of these firms which took one graduate last year selected two of eight appointees from this year's graduating class.

The graduates have gratifying success in the state bar examinations. In the examination in June, 1929, 92 per cent of the university candidates were successful and 40 per cent of all other candidates.

Law alumni.—The school has approximately 3,000 living graduates. No school has more loyal and helpful alumni. They maintain an active association of 1,200 members. The alumni and other friends of the school have provided a loan fund of \$2,200 for law students. They are contributing annually twenty or more scholarships of \$150 each to aid self-supporting student editors of the *Minnesota Law Review*. This is the most helpful gift that the school has received. It has stimulated scholarship throughout the school, enabled the recipients to get more out of their law course, and improved the work on the *Review*. Another gift was the fine oil portrait of Professor Fletcher.

Minnesota Law Review.—The fourteenth volume of the *Law Review*, completed this year, contains 864 pages. The *Review* has grown steadily in size and quality. Its subscription list has grown annually. The number of subscribers in 1920-21 was 825. At the present time the number is 2,017.

The *Law Review* furnishes an opportunity for research for the best students in the Law School. It provides postgraduate instruction for the lawyers of the state. It contributes to the improvement of the law and

practice of the state. By contract with the State Bar Association, it is sent to all members of the association, and it has contributed to the up-building of that organization. It has been from the beginning wholly self-supporting, has never had a deficit, and has accumulated some surplus.

The *Law Review* holds a high place among legal periodicals. It has not only stimulated legal scholarship and elevated standards within the Law School, but has brought credit to the University throughout the country. Its subscription list includes the highest court libraries in the United States and several libraries abroad.

THE FOUR-YEAR LAW COURSE

By recent action of the Board of Regents, six years of university work will be required for the degree of bachelor of laws of students entering the Law School after March 1, 1931, this period to be apportioned to liberal arts and to law as the faculty of the Law School may prescribe. The degree of bachelor of science in law may be conferred upon students who complete two years of work in liberal arts and two in law.

It seems fitting here to state the purpose of, and reasons for, this action. As already stated, two years of college work and three years of study in a day law school or four years in a night law school will hereafter be required for admission to the bar of Minnesota. It has also been pointed out that nineteen of the leading universities are now requiring six or seven years of college and law school study for the degree of bachelor of laws. Our Law School has been requiring five years since 1910. It was recognized that the time has come when, if we are to maintain our position as one of the leading law schools of the country, we should increase the required period of study. In this respect we are merely following the practice of the other leading universities in the country.

At present the University offers a combined course of six years, three years in liberal arts and three in law, for which the student receives the degree of bachelor of arts on completing his fourth year in the University and the degree of bachelor of laws on completion of the course. This practice, too, is common to many universities. It is our intention to continue this combined course for the present at least, but to offer an alternative course of two years in liberal arts and four years in law, conferring upon the students the degree of bachelor of science in law at the end of the fourth year, and the degree of bachelor of laws on completion of the course. It will also be our policy to encourage students to elect the latter course. In this respect we are departing from the almost universal practice of American law schools.

The movement for increased requirements has everywhere been in the direction of more college work. No day law school requires more than three years of law study. Five years of university study could not be better apportioned. But we are of the opinion that the additional year should be devoted to law school study rather than to college work. No one would deny the desirability of a complete college course if there

were time for it, and also for a complete law course. But since choice must be made, we believe that the additional year will be better used in a broader study of law than it would be in further studies in liberal arts.

Our present law curriculum is as extensive as the time permits, but it is narrowly restricted to training students for client caretaking. No undergraduate courses are offered in any of our law schools with the primary purpose of studying legal institutions in a critical and comparative way. Altho our law graduates will be the judges and legislators of the future, no courses are provided to train them specially for these functions. Law curricula throughout the country have neglected the public aspects of the professions. Law schools have been merely vocational training schools, training for client caretaking and paying little or no attention to training for public service.

Attention has become sharply fixed on the administration of the law. The thoughtful and far-seeing have long since criticised its weaknesses. Years ago Chief Justice Taft said: "Of all the questions which are before the American people, I regard no one as more important than the improvement of the administration of justice." Recently the members of the National Economic League voted that the improvement of the administration of justice is the most important question before the American people at the present time. Not long ago Chief Justice Marshall, of Ohio, wrote: "The conclusion that there has come to be a lack of proper adjustment between the administration of law and the needs of our community can no longer be denied. There is apparently a growing realization that something more than superficial impressions are needed—that the task calls for searching and tireless study into causes and effects and, above all, accurate knowledge as to which parts of the machinery of justice fail in their functions."

It has been exceedingly difficult to interest lawyers in these questions. They are not part of the lawyer's practice. In his service to his client, he follows the beaten path. Indeed, he cannot do otherwise. Practitioners in medicine, dentistry, engineering, and in the natural sciences must keep up with the current thought in their several fields for proficiency in their practice. They use new ideas so soon as discovered and proved. On the other hand, changes in the administration of law can generally be effected only through the actions of legislators, and to a limited degree through the actions of judges. The lawyer has consequently no incentive to compare the administration of law in his state with the practice in other jurisdictions, or to seek new ideas and new methods of practice. It is rather to his interest that old practices continue, and that he should not have to adjust himself to new ideas.

One would think that the university law schools would have been awake to this condition and seeking to correct this tendency. On the contrary, the law schools without exception have failed in their duty to interest the future practitioners in these matters. They have given the information and skill necessary to enable the lawyer to serve his client. They have not given the information, skill, or interest necessary to enable the

lawyer to serve the state through improvement in the administration of justice.

It is strange indeed that there is not in the undergraduate course of any law school in the United States a course on the administration of justice, the organization of courts, selection of judges, function of judges, place of the jury, and similar questions. Likewise, there is little comparative study of the law itself, its history, and related subjects such as criminology and penology. In no school is an undergraduate law student required to study any one of these subjects. In most schools, including our own, they are not even offered. In a few schools, some of them are offered to graduate students, but the graduate student body is made up almost wholly of future law teachers, and consequently the graduate course does not touch the men who become the future judges, legislators, and practitioners.

The loss to the law and its administration from the restricted scope of the studies available is incalculable. In each of the forty-eight jurisdictions in our own country alone, there are features of law administration which, combined in one jurisdiction, might produce an almost ideal system. But the lawyers of one state are unaware of the practices in other states. Furthermore, the law schools are training the future legislators and judges, and teaching them nothing of the science and art of legislation or of the function of the judicial office.

For the present state of the administration of law, the law schools must take a considerable share of the blame. Some schools are now looking about to see what they can contribute. Several of them, such as the new Institute of Law at Johns Hopkins, Harvard, Columbia, Yale, and Northwestern law schools are raising considerable sums of money for research along these lines. Such action is wholly good. There is great need for research, and it is desirable that a number of institutions have adequate funds to make exhaustive researches into the administration of the law. But the results of these researches will be fruitless unless a professional and public opinion is educated to act upon them. Instruction in the administration of law must be given not only to law teachers, but to the whole body of the profession. It must be remembered that in this field, change can come only through legislative and judicial action supported by professional and public opinion.

Of course it must always be borne in mind that the primary function of the law school is to train its students to take care of clients' interests. The present three years course seems necessary for this training. A thoughtful survey of the curriculum does not reveal where time could be saved. If these additional subjects are to be required of law students, additional time must be given to the law course. This will be no hardship when the student is relieved of a corresponding period of study in the liberal arts college.

There were in the past reasons for a more extended college course which have ceased to be valid. When law was studied in law offices, the college course was the chief means of mental discipline. Now the law

studies themselves are an unexcelled means of mental discipline. They are, as now pursued in our leading law schools, as cultural as any others. Students in liberal arts colleges give most of their attention in the third and fourth years to a major. Law is a proper major for law students. They should know law in all its aspects rather than another field less directly related to their future activities. These studies are no less cultural because they are also useful.

Again, better results would be obtained if students began their professional studies earlier in their course. They develop in the professional course a seriousness of purpose too often lacking in students of liberal arts. We know that students do better work when their efforts are directed to a definite end.

Our faculty has studied the courses for the training of lawyers not only in the United States but also in England and in the civil law countries. In England and on the continent of Europe, the law student may begin his professional course on entering the university, but the course is broader than in American schools and includes subjects taught in the American liberal arts courses and other subjects such as legal history and Roman law not taught in either the liberal arts or the undergraduate law courses in America.

We plan to develop a four-year law course based on two years of liberal arts. It is our intention to give in that course little, if any, more of the type of work now being taken by students in the three years course. The additional year will be devoted to the study of the administration of law, legislation, its theory, function, and methods, comparative law, legal history, jurisprudence, criminology, penology, and similar subjects. The object will be to train the students to discharge the public responsibilities that should go with their office.

Time may also be found for instruction on some subjects highly desirable for general practice. The lawyer today needs a knowledge of accounting, banking, and finance. Some of these subjects may be included in the additional year.

The degree of bachelor of science in law will be conferred upon students who have taken two years of liberal arts work and two years of law work. On completing two additional years of law work, they will receive the degree of bachelor of laws. This course will correspond closely with the practice in the medical schools. Oxford University confers the bachelor of arts in jurisprudence on three or four years of arts and law study, and the degree of bachelor of civil law on completing a further period of law study.

The degree of bachelor of science in law, based on two years of arts and two of law study, will satisfy the needs of some students who are not looking forward to the practice of law, but desire some training in law as a preparation for positions with trust companies, banks, and investment companies. At present the course in the School of Business Administration contains less law studies than these students desire, and the course for the degree of bachelor of laws contains many subjects unnecessary to their

purpose. The proposed course would give them the desired training and a degree on completing four years in the University, omitting the subjects not essential to their purpose. They may, of course, go on to the degree of bachelor of laws should they so desire. A number of graduates of the School of Business Administration are now taking the law course for business purposes. This two-year law course will admirably serve their purpose.

This program, which has already received the sanction of the Board of Regents, will require that the faculty of the Law School be increased by three additional professors within the next five years. These new appointees will be necessary to take care of the new subjects, or to relieve present members of the faculty who would be shifted to these topics.

We believe that this program will produce a better type of lawyer than we have had in the past. He will have a broader vision—will see law as a phase of human relations varying in time and place. His interest in the public aspects of his profession will be increased. He will appreciate better the place of law and courts in society. His acquaintance with other legal ideas and systems will give him a flexibility of mind now too often lacking. We hope that he will develop a philosophy of law that will give him a sense of direction in his professional activities.

There will also be a distinct gain in having on the university faculty specialists in these several fields. Administration of law is now the weakest part of our legal system. It has had no attention from the universities. The field is outside the range of members of the present faculty. The University will be able to provide leadership in it, as it is now doing in other fields.

Respectfully submitted,
EVERETT FRASER, *Dean*

THE MEDICAL SCHOOL

To the President of the University:

SIR: I have the honor to submit the report of the Medical School for the biennium, 1928-30.

ENROLMENT

The details of student registration will be found in the registrar's report. Suffice it here to say that the number of medical students averages about 135 in each of the four classes with an equal number in the intern year required for the M.D. degree.

We take one hundred into the freshman class each fall, selecting them from 300 or more applications. In place of the "unclassified" group formerly accommodated we now take 40 additional freshmen on January 1. These students take as their official freshman year the winter, spring, and summer quarters and in the fall join on equal terms the 100 fall quarter freshmen of the previous year to make up the sophomore class.

Our number of students makes this the second largest medical school in the country. We feel the number is too large for the best results of teaching, notwithstanding our continuous use of facilities throughout the year under the four-quarter system.

We feel further that the policy of preference to Minnesota residents prevents to a certain degree the selection of the most promising material from our large number of applicants. Most applicants residing outside the state have to be rejected, regardless of qualifications. From the standpoint of securing the best prepared and most cosmopolitan student body the policy of Indiana University that its Medical School exists to prepare physicians for the state seems preferable to our presumably accepted theory that the Medical School exists to educate the children of the taxpayers.

These remarks on student enrolment concern themselves with medical students only. It is to be recalled that the Medical School administers also the Nursing School curriculum and the Medical Technicians' curriculum. The enrolments in these courses are available in the registrar's report and other details will be found in the reports of the directors of these activities appended hereto.

The policy at Minnesota is that the Medical School, through its departments, teaches all students who need its discipline as part either of a general education or of professional training. Consequently large numbers of students of Home Economics, Dentistry, Physical Education, Agriculture, Pharmacy, the Graduate School, etc. receive part of their training in the Medical School. These enrolments are naturally classified elsewhere.

ACTIVITIES

Comprehensive examination system.—During 1929-30 the faculty has worked out and put in operation a system of examinations by which progress in the medical curriculum is made not by passing examinations on single courses but by a single examination on all the work of a given year.

The thought is that the student should regard his education in terms of a large objective, should demonstrate capacity to keep in mind the essential substance of an entire year's work. Each year's examination is in charge of a special committee. The administration of all examinations is centralized. Dr. A. T. Rasmussen, of the Department of Anatomy, has done a noteworthy service as chief examiner. The first trial of the system this spring convinces the various committees that the comprehensive examination has advantages and that the number of failures, tho distributed differently, is not increased over the old system.

New hospital units.—The completion in the fall of 1929 of the Eustis Children's Unit, the Out-Patient Unit, and the Students' Health Unit greatly increased and improved our teaching facilities along clinical lines. The number of hospital beds was increased to about 400, with adequate and beautiful quarters for children. The modern out-patient quarters led very soon to a distinct increase in number of patients available for this most useful type of teaching. The bringing of the Student Health Service to the medical campus and its integration so far as bed patients are concerned with the University Hospital, have improved the Health Service, unified the University's hospital activities, and brought the significant values of the Health Service as a community health movement more to the attention of future physicians.

Readjustments in Millard Hall.—The transfer of the out-patient service to its new quarters in the hospital group vacated considerable space in Millard Hall and enabled the scientific departments therein to expand. Pharmacology in particular which has been housed for fifteen years in Physiology space, gets adequate and convenient quarters in the north wing. Building changes essential to these readjustments are just being completed.

RELATIONS WITH THE MEDICAL PROFESSION

These relations have become measurably more harmonious and co-operative in this two-year period. Three movements have contributed to this result.

The alumni have become more active. Their Advisory Committee meets regularly with the dean and hospital superintendent to consider school matters. During the meeting of the American Medical Association in Minneapolis in June, 1928, the alumni of our school held the largest meeting and banquet in the history of the school. Perfecting their organization they have instituted a clinical program each fall at homecoming. The first was realized in 1929 and was satisfactorily attended. The entire program was put on by alumni, Dr. Otto Folin, distinguished biochemist of the Harvard faculty and Minnesota graduate, being the guest of honor. Through these meetings an increasing number of alumni gain insight into the aims and problems of the school. To Dr. O. S. Wyatt and Dr. N. O. Pearce we owe much of value coming out of alumni interest.

The second activity contributing to better relations with the profession has been the extension courses for physicians. While administered by the

Extension Division the actual teaching has naturally fallen upon members of the faculty. Weekly series of lectures on topics of value to medical men are offered in any part of the state when a center of interest exists. A considerable number of such courses have been completed and others arranged for. The State Medical Association contributes and co-operates. Dr. N. O. Pearce is largely responsible for the success attained. Of the full time staff Dr. W. A. O'Brien has contributed much time and effort to work among the doctors. We owe all these gentlemen a great debt. To various other participating faculty members we give best thanks for a largely unpaid but very valuable service.

In this connection should be mentioned the informal consultation service developed as another joint activity of the Medical School and State Medical Association. This idea, again, emanates from Dr. Pearce, now president of the Medical Alumni; and Dr. W. A. O'Brien, pathologist of the University Hospital, active publicist, tactful adjuster of difficult situations, is again the man selected to conduct the machinery by which doctors in rural practice can get expert information on troublesome cases. Dr. O'Brien, on account of his peculiar abilities and on account of his position, is also the choice of the State Association as radio speaker for the profession. This is an important educational effort. We are proud to have such a man as Dr. O'Brien available for activities like these just described.

Thirdly, as a factor in bettering relations with the profession and throughout the state should be mentioned the work among the doctors and county officials of Mr. Paul Fesler, superintendent of the University Hospital. He spends a good deal of time in the various districts and strives to make the hospital more useful both to physicians and to the sick poor. Through Mr. Fesler's efforts and with the invaluable help of Dr. Herman Johnson and Dr. C. B. Wright—to name but two of numerous influential physicians interested in the matter—the appropriation for the University Hospital has been separated from the general university appropriation and increased. Inasmuch as the hospital is chiefly justified, in popular view, as a service institution this arrangement is fairest alike to legislature, taxpayers, and the University as a whole. Too much praise cannot be accorded Mr. Fesler for his kindly, tactful, diligent efforts to bring the hospital in accord with the ideals of the profession and increase its effectiveness as a central institution for unfortunate citizens.

RESEARCH

This school has always carried on active research along various lines. The program has been stimulated and expanded in the biennium by the special appropriation of \$25,000 a year for medical research granted by the last two legislatures. This fund is apportioned to various projects advanced yearly by interested members of the faculty. More and more funds from outside services are becoming available by gifts of individuals and corporations for special projects. Several departments publish their papers yearly as bound volumes of reprints. In a brief report details cannot be set forth. Those qualified to judge consider the quality and number of our

publications as placing us among the noteworthy medical schools in this respect.

INTRA-UNIVERSITY FACULTY RELATIONS

The Medical School is proud of the contributions made by its members to the broad problems of the whole University and mentions particularly the important work done by Professor R. E. Scammon in connection with the insurance plan for the faculty and employees recently adopted by the Board of Regents.

SYMPOSIUM

Early in 1929 the director of the Summer Session proposed that funds be devoted to a limited number of special projects outside the ordinary routine of class work. Taking advantage of the fact that the International Physiological Congress was to meet (for the first time outside of Europe) in Boston in August, the Medical School and agricultural biochemical groups proposed that a Symposium on Physiology and Physiological Chemistry be held at Minnesota. The plan was approved and carried out July 15 to August 15. Distinguished foreign scientists contributing were Professor M. von Frey, Wurzburg; Professor T. Thunberg, Lund; Professor E. Laqueur, Amsterdam; Professor E. Waldschmidt-Leitz, Prague; Professor G. V. Anrep, Cambridge. Several well-known Americans in addition to our own men participated. Attendance at these lectures was good. A large amount of interest was stimulated. The project was continued this summer by a symposium on "The Kidney in Health and Disease," July 7-18, under the chairmanship of Dr. Hilding Berglund.

ADVANCED STUDY

Graduate work in medical subjects and the training of medical graduates as specialists comes under the Graduate School and is reported by the dean of that school. In this place is noted only that the number of such students getting training in the Medical School and under its faculty is increasing. Our men are going out to good posts in other universities and filling vacancies in our own faculty. Some go to the higher walks of practice. The presence of the graduate group is stimulating in undergraduate education. The Medical School is proud of its participation, along with the Mayo Foundation, in the largest existing experiment in medical graduate education.

CONCLUSION

Taken broadly it is believed this review of its activities demonstrates that the Medical School is continuing its useful function as a teaching and investigative mechanism, has gradually strengthened its facilities and man force in the last two years, has widened its influence in the state, and has contributed to the prestige of the University the world over.

The reports of the School of Nursing, Public Health Nursing, the Hospitals, and the Social Service Department are appended.

Respectfully submitted,
E. P. LYON, *Dean*

SCHOOL OF NURSING

The following report is submitted by the School of Nursing for the two-year period, July 1, 1928 to June 30, 1930.

A detailed report of regular students registered in the School of Nursing for the past two years will be found in the registrar's report.

During the past two years the Alumnae Association of the School of Nursing has given two \$25 prizes each year for efficiency in practical work. The Nurses' Student Government Association has given \$100 each year as a scholarship for advanced work to the most deserving applicant in the graduating class.

In September, 1929, four graduating seniors were accepted at teachers college for a course in field work in head nursing on a part time scholarship basis.

A rearrangement of the five-year courses was effected this year after conferences with Dean Lyon, Dean Haggerty, Dr. Diehl, Miss Butzerin, and Miss Vannier.

As now arranged, the course leads to degrees of bachelor of science in the College of Education and graduate in nursing. In the case of those electing public health nursing, it also leads to a certificate of public health nursing. It is planned to prepare students for such public health positions as visiting nursing, school nursing, and health teaching, infant welfare, rural and industrial nursing, and for administrative, supervising, and teaching positions in hospitals and schools of nursing.

In the case of graduate nurses from accredited schools whose records are such as to warrant special permission, the following arrangements can be made for earning the degree. The required subjects of the junior college work may be taken either previous to, combined with, or following the work of the nursing education or public health major, the entire number of credits earned plus the credits granted for hospital work to total 180 credits.

Detailed information is given in the College of Education bulletin.

Respectfully submitted,

MARION L. VANNIER, *Director,*
School of Nursing

PUBLIC HEALTH NURSING

I herewith submit a biennial report of the registration and activities concerned with the curriculum of Public Health Nursing in your department.

There has been a gradual increase in the attendance throughout the academic year, with a marked increase during the successive summer sessions. We believe we have been particularly fortunate in securing well-qualified women and leaders in the public health nursing field of education for the past three summers, during which time Dean Lyon has granted an additional allowance for the summer school teaching. An analysis of our summer session students for the current year indicates a representation from sixteen different states.

There have been a few curriculum changes during the past biennium which should be noted:

1. The curriculum leading to a degree of bachelor of science with a major in public health nursing has been revised and transferred from the College of Science, Literature, and the Arts to the College of Education. We believe that some real improvements were made possible through the revision of the curriculum, and we have an increasing number of students working toward a degree.

2. Several minor changes have been made in regard to credit allotment in other courses, involving Mental Hygiene, Principles and Special Fields of Public Health Nursing, and Field Practice in Infant Welfare. Several new co-operative relations have been established in regard to our field work in public health nursing with rural communities and school nursing service in small communities.

3. Eight students have had the privilege of the use of scholarships to help them carry on their university work.

4. A very casual survey indicates that the former certificate students are distributed throughout seventeen states, and three countries are represented. Rural nursing is a service most frequently undertaken by these former students, school nursing and visiting nursing being the next most frequently selected fields.

A few very definite needs present themselves in making plans for further development. Minnesota is a distinctly rural state, and should offer through its available resources a specialized field for the education of nurses as adapted to rural health services. With a tendency in our enrollment to show an increase in the number of maturer students, a demand is being felt for the development of a field for the training of supervisors in public health organizations. The theoretical courses in methods of health teaching in the schools and in supervision of public health nursing, which are being offered in the summer time, are very desirable subjects to be included during the regular academic year. The need for a practical demonstration field for the study of the school health program is partly being met in an experiment with a public school in Minneapolis during the current summer.

The director wishes again to emphasize the sustained and splendid co-operation which prevails in our affiliation with the local agencies, which makes possible our practice fields for the public health nursing students. Constant study and attention are necessary in order to maintain high standards of service, and in order to correlate more thoroly theory and its adaptation to the practical job.

Respectfully submitted,

EULA B. BUTZERIN, *Director*

UNIVERSITY HOSPITALS

I submit herewith a statistical report of the hospital for the years ending June 30, 1929 and 1930, respectively. The report is self-explanatory. A detailed report of the scientific work of the institution is to be prepared for distribution to the medical profession.

It is unnecessary to mention the changes in the physical plant other than to say that the newer portions of the building have made possible the extension of practically all services. The Out-Patient Department is growing daily and now has an attendance unequalled in its history. The obstetrical service has been doubled, beds were added to the pediatric service, and the new orthopedic service is being used to capacity.

The new buildings have made the operation of the hospital awkward, and we are endeavoring to remodel the old building to fit into a unit. All of our service departments must be enlarged and in some places relocated to accomplish economical operation of the entire plant. This is especially true of the X-Ray and Physiotherapy departments. The laboratories have been enlarged. The kitchens, dining rooms, and laundry were adjusted in the remodeling of the service building.

From the standpoint of administration, I would call attention to the reorganization of the Admission and Record departments. Under this new scheme all patients are admitted through the Out-Patient Department. Each patient is given a complete physical examination by a member of the staff. In this way we should be able to make full use of our clinical material and, at the same time, assure the patient more prompt and scientific care. Both in and out patients receive such care.

The records of the Out-Patient Department and hospital have been combined. This should prove of exceptional value in the use of the records for the study of scientific data. A Soundex System which was necessary in handling a large number of records, has been installed.

Of course, the staff is the backbone of any hospital. The work of our staff should be commended. The weekly staff meetings under the direction of Dr. W. A. O'Brien have been an inspiration to the whole personnel. They have been the means of focusing attention on the complicated and interesting patients and have brought about close co-operation on the part of the whole staff.

All departments have improved. We have had meetings of various medical and social groups during the year thereby bringing about improved understanding by the public.

The Faculty Women's Club has formed an auxiliary which has been of great help to the hospital. The work of this group is of much value to our patients and is appreciated.

The superintendent has attended meetings of hospital groups, medical societies, state and sectional meetings of the State Conference of Social Work, and visited doctors and county officials in all parts of the state to ascertain how the University Hospital can be of most service. He has also attended meetings of the American Hospital Association, the American College of Surgeons, and the International Society for Crippled Children. All of these organizations contribute much to the field of hospital administration.

The needs of the institution are many. They have been presented to the Board of Regents. A nurses' home and a psychopathic hospital are especially needed.

Respectfully submitted,

PAUL H. FESLER, *Superintendent*

(Statistical)

IN-PATIENT DEPARTMENT

	1928-1929	1929-1930
Patients in hospital at the beginning of the year....	236	228
Total number patients admitted		
Private	183	319
Pay	1,073	1,093
Free	761	876
County	2,314	2,698
Health Service		894
Totals	4,331	5,880
Total number patients treated		
Private	169	293
Pay	1,031	1,093
Free	741	678
County	2,531	3,020
Health Service		890
Totals	4,472	5,974
Total days' hospital care		
Private	1,783	3,703
Pay	11,511	12,659
Free	7,632	9,176
County	61,922	75,803
Health Service		4,527
Totals	82,848	105,868
Average days per patient		
Private	10.55	12.
Pay	11.16	11.58
Free	10.3	13.53
County	24.46	25.1
Health Service		5.
Totals	14.01	13.04
Highest daily census	259	388
Daily average number of patients		
Private	4.88	10.14
Pay	31.43	34.68
Free	20.9	25.11
County	169.61	207.88
Health Service		11.8
Totals	226.82	288.69

OUT-PATIENT DEPARTMENT SUMMARY

	1928-1929	1929-1930
New patients treated		
Day clinics	14,810	15,754
Night clinics	248	138
Totals	15,067	15,892
Total patients' visits made		
Day clinics	53,974	59,347
Night clinics	6,920	5,834
Totals	60,894	65,181

THE PRESIDENT'S REPORT

Average visits per day			
Day clinics	187.63	196.51	
Night clinics	64.27	55.56	
Total average per day including day and night clinics	201.63	215.83	
Drug prescriptions filled	19,816	20,242	
Optical prescriptions			
Gratis	12	10	
Paid	901	1,013	
Totals			
		913	1,023
X-ray requests			
Gratis	405	451	
Paid	2,102	2,604	
Totals			
		2,507	3,055

DISPENSARY REPORT 1928-1929-1930

Patients attendance record		1928- 29	1929- 30		1928- 29	1929- 30
Day clinic—first entries	13,346	15,754	Daily average	44.33	52.16	
Day clinic—attendance	50,478	59,347	Daily average	187.63	196.51	
Night clinic—first entries	224	138	Nightly average	2.28	1.31	
Night clinic—attendance	6,299	5,834	Nightly average	64.27	55.56	
Total day and night clinic						
First entries	13,570	15,892	Daily average	45.08	52.62	
Attendance	56,777	65,181	Daily average	188.62	215.83	
Fees collected						
			1928-1929		1929-1930	
Day clinic fees @ 20c	42,789	\$ 8,557.80	49,633	\$ 9,926.60		
Night clinic fees @ 20c	5,376	1,075.20	4,696	939.20		
Dental extractions and treatments		692.70		672.25		
Refraction fees @ \$1.00	938	938.00	1,043	1,043.00		
Electrocardiograms @ 25c	123	30.75	260	65.00		
Electrocardiograms @ \$5 and \$3 (private case)	1	5.00	1	3.00		
Orthodiagrams @ 50c	170	85.00	157	78.50		
Orthodiagrams @ \$2 (private cases)	8	16.00	9	18.00		
Orthodiagrams @ \$2.50 (private case)	1	2.50	..	..
Basal metabolism fees @ \$3 .....	..	..	254	762.00	
Basal metabolism fees @ \$2 .....	..	..	1	2.00	
Basal metabolism fees @ \$1 .....	..	..	4	4.00	
Drug prescriptions	19,816	7,337.10	20,242	8,286.90		
Genito-urinary treatments @ 50c .....	..	..	2,064	1,032.00	
			\$18,740.05	\$22,832.45		

X-ray fees

1928-1929		1929-1930	
12 @ \$5.00.....	\$ 60.00	1 @ \$6.00.....	\$ 6.00
322 @ 4.00.....	1,288.00	1 @ 5.50.....	5.50
477 @ 3.50.....	1,669.50	18 @ 5.00.....	90.00
404 @ 3.00.....	1,212.00	4 @ 4.50.....	18.00
107 @ 2.50.....	267.50	405 @ 4.00.....	1,620.00
364 @ 2.00.....	728.00	556 @ 3.50.....	1,946.00
410 @ 1.50.....	615.00	535 @ 3.00.....	1,605.00
2 @ 1.00.....	2.00	106 @ 2.50.....	265.00
4 @ .50.....	2.00	419 @ 2.00.....	838.00
		543 @ 1.50.....	814.50
		3 @ 1.00.....	3.00
		13 @ .50.....	6.50
	\$5,844.00		
Less refunds	18.50		
	<u>\$5,825.50</u>		
		Less refunds	\$7,217.50
			30.50
			<u>\$7,187.00</u>
		Glen Lake X-rays ..	103.50
			<u>\$7,290.50</u>

Optical report—F. J. Van Drasek

	1928-29	1929-30
Optical prescriptions paid	889	1,013
Optical prescriptions free	12	10
	<u>901</u>	<u>1,023</u>
Total	\$4,923.00	\$6,446.08
Pairs of glasses supplied	931	1,147

MINNESOTA GENERAL HOSPITAL

	1928-29	1929-30
Total cost of operation.....	\$380,943.16	\$543,318.25
Less Out-Patient Department	\$41,821.21	\$38,240.79
Less Social Service	11,450.52	11,934.29
Less capital expense	12,934.55	40,094.95
Less clinical service	18,300.00	21,650.00
	<u>84,506.28</u>	<u>111,920.03</u>
	\$296,436.88	\$431,398.22
Patient days	82,848	105,868
Cost per patient days	\$3.578	\$4.07
Income		
Pay bed	\$ 55,702.25	\$ 95,675.89
X-ray	7,032.83	9,999.05
Out-patient	19,518.80	16,875.45
	<u>\$ 86,101.59</u>	
Pharmacy		8,648.71
Miscellaneous		336.03
		<u>\$131,535.13</u>
Building fund deducted		
Clinical salaries nursing ...	15,000.00	17,800.00
Out-Patient Department ...	13,500.00	12,500.00
Cancer	3,300.00	3,850.00
	<u>\$ 31,800.00</u>	<u>\$ 34,150.00</u>

	1926-27	1927-28	1928-29	1929-30
Salaries and wages	\$179,039.94	\$174,310.68	\$186,377.58	\$254,418.53
Supplies	125,236.40	121,842.22	133,157.61	194,902.72
Expense	25,964.29	25,619.99	48,473.42	76,759.30
Capital	19,493.83	15,004.96	12,934.55	17,837.70
	\$349,734.46	\$336,777.85	\$380,943.16	\$543,318.25
Patient days	78,980	87,363	82,848	105,868
Out-Patient expense	45,016.79	41,782.81	41,821.21	38,240.79
Receipts	68,377.64	79,541.30	86,101.59	131,535.13
Reimbursements		100,000.00	100,000.00	
County claims	213,646.10	229,596.19	225,830.10	290,100.40
Commissary				
Supplies	62,635.96	61,691.54	66,460.13	90,456.41
Cost per day	79.3	70.6	80.2	85.4

SOCIAL SERVICE DEPARTMENT OF THE UNIVERSITY HOSPITAL

The work of the Social Service Department entered a period of re-organization on October 1, 1929. During the first three months, the department was studied in order to ascertain its history, method, and content. The relationship of the Social Service Department to the other departments of the hospital and to the University was next considered. Meanwhile, in view of the fact that patients were constantly being referred, there were many questions to consider in regard to our relationships with other hospital social service departments of the Twin Cities and with the non-medical social agencies of the Twin Cities and state.

INTRODUCTION

In January, a new record system and method of statistical accounting was put into operation. Thus, the figures for this report are taken from January to June, inclusive. The present record system permits the recording of slight services and intensive cases on the standard size record, conforming with the size of the medical record. All records are numbered, whether they be slight service or intensive, and are filed in the social service office. Each patient has his own record, but members of the family, also patients, are referred to under identification.

Comparison of this record form with the minimum standards of the American Association of Hospital Social Workers reveals that our form is somewhat above minimum requirements. Statistics of the department are being kept in such a manner that our figures are passed on through the Minneapolis Council of Social Agencies to the Joint Committee of the Association of Community Chests and Councils, of the local Community Research Committee of the University of Chicago. In addition to these very general figures, more detailed information is kept from month to month for the information of the director, in order to determine where the work most needs strengthening. A new record index was made this winter, which facilitates the handling of old records and makes the consultation of new ones very simple and accurate.

The functions of hospital social work, as understood by both the Ameri-

can College of Surgeons and the American Association of Hospital Social Workers are:

First, and most important of all, medical social case work, which means assisting the doctor in the care of the patient through medical social case study, requiring the assembling, analyzing, and evaluating of all data obtained for the purpose of working out a proper medical social plan correlated with diagnosis, treatment, and follow-up; second, interpretation of the hospital to the community, and the patient to the hospital; third, teaching; and fourth, contributions to study and research. Let us examine the work of the department for the past six months from these points of view; considering, our methods of work and also plans to be undertaken in the months to come, with the hope of making a larger contribution to the hospital and to the community in the coming year.

CASE WORK

The total number of social service recorded cases dealt with, from January, 1929, through June, 1930, was 536. Of this number, 163 were intensive, 215 slight service, and 158 steering.

An intensive case is one in which the medical social worker makes a social diagnosis, sets in motion a plan for social treatment, and retains the primary responsibility for case work. These cases are usually those in which the social problem and medical condition are so closely interwoven that it is the responsibility of the hospital social worker rather than a non-medical worker to work out an adjustment for the patient.

A slight service case is one in which the medical social worker performs one or more services for a patient without making either a complete investigation of the case or a social diagnosis. It is sometimes necessary to handle a case in this way, altho we recognize there may be other problems present besides those we attempt to handle. Usually, however, the cases which fall into this group are those which actually do not have complicated social factors but which, as hospital social workers, we should serve, because their medical treatment will not be so complete unless some one of the recommendations made by the doctor can be carried out. Following are a few illustrations:

Securing admission to the hospital for a patient who has either refused to come or has been unable to do so.

Securing convalescent care.

Making application and arranging for transfer to a sanatorium.

Securing medical relief in the form of glasses, artificial teeth, and those surgical and orthopedic appliances which cannot be secured directly through the county.

In certain cases, medical follow-up.

A steering case is one in which the social responsibility is borne by some social service agency outside the hospital, and in which the medical social worker interprets the patient both to the medical authorities of the hospital and to the non-medical social service agency, and co-operates with the latter in its social treatment of the case.

The total number of cases carried from January to June, inclusive, was 536, of which 154 were carried over from December. Twelve were old cases reopened; 31 were recurrent re-opened, and the remaining 339 were new.

Old cases are those known to the department but not treated during the present calendar year. Recurrent cases are those active during some previous month of the present year.

As the old re-opened cases usually present new problems, they are grouped statistically with the new cases in the following figures:

The average number of cases carried each month was 228, of which 58½ were new. A case can seldom be closed during the month it is referred, and often it is necessary to carry it as long as six months. Thus the case workers average case load is from 45 to 50 patients each month. The average number of case workers during this last six-month period was 4½.

Since the Social Service Department works with only a small percentage of patients receiving medical care, it may be of interest to know how these 351 new cases came to our attention: 212 were referred to the department from within the hospital, 78 being referred by the physicians in the dispensary, 94 by the physicians in the house, 23 by the hospital administration, chiefly the Admission Department, 12 by head nurses, and 5 by the Social Service Department itself. Refers from outside the hospital amounted to 139. Of this number, 108 were referred by other social service agencies, chiefly of the Twin Cities, but to some extent by county representatives. The remaining 31 were refers made by relatives, interested individuals, such as employers, ministers, or by the patient himself. The Social Service Department was aware of more problems than those worked on, but it was impossible, with the small staff, to take on additional work. This fact explains why the department took only 5 cases on its own initiative. Those problems which other people were justified in asking us to work with we felt obliged to take first.

Often we were obliged to handle a somewhat intensive case as slight service and to count as unrecorded, some service which we should have extended further. Thus these figures do not entirely represent what went into the work.

INTERPRETING THE HOSPITAL TO THE COMMUNITY AND THE PATIENT TO THE HOSPITAL

It is impossible to say how much or how little of this sort of service we perform. It is to be hoped that every case which we work with offers some sort of favorable interpretation, but when we merely explain the hospital or some medical procedure or the need for treatment, and do nothing further, we consider this merely a part of the day's work, and make no record of any sort. Following are the interpretive types of service rendered in this way:

Reports to other agencies	313
Patients directed to other institutions or agencies	18
Advice to the admitting department in regard to fees	150
Advice or interpretation to patient or to his family	337

Advice and interpretation to the patient or his family was given in 180 instances by personal interview, 91 by letter, and 15 by visit.

Unrecorded services require from 10 minutes to an hour with each case.

In addition to the unrecorded work, 88 letters were written by the head of the department in regard to more or less complicated cases no longer in the hospital, but concerning whom the interested agency or institution wished interpretation of the former medical or social history; 96 cases were interviewed in regard to the suitability of dispensary admission.

Another type of interpretation which the department has participated in, has been in relation to the work of the Faculty Women's Club. The hospital section has helped a great deal in conjunction with recreational work for the children in the wards. Twelve members came from March to June, serving two hours an afternoon of each week—ninety-eight hours were so spent.

Infants' garments made by another section of the Faculty Women's Club have been very gratefully received.

The work of the Motor Corps for local patients unable to attend clinics has been most helpful in meeting certain needs for service. From the middle of March through June this corps made possible twenty-seven trips to the homes of patients and the return of patients to their homes after dispensary treatments.

TEACHING

The teaching done by the Social Service Department from October, 1929, through June, was confined chiefly to the work of the medical social service students. At first, it seemed unfair to the development of the work of the department to devote much time to teaching, and unfair to the students to accept them. One graduate student came during the winter quarter and has continued through June. In the spring quarter, two more graduate students and three undergraduates were with us. Their work was a contribution to the department, both in case work performance, and through the stimulating effect they had upon the staff. The actual time which a student gives and takes just about cancels.

The teaching was continued with the home economics students; during the fall quarter, there were 7 students, winter quarter 9, and spring quarter 6. This year, the interpretation of hospital social work was done through lectures by the Sociology Department; and field work and interpretation was given one day a week by the Hospital Social Service Department.

SPECIAL STUDIES AND RESEARCH

Nothing has been done this year, and little will be undertaken next year in any direct projects of this sort, as it seems sounder first to build up the service to the patient through case work of as high an order as possible. However, the statistics of the department are kept in such a way that, as already indicated, they supply contributions to research. A second and somewhat more indirect contribution to studies is through having records of the past six months searched by a graduate student for thesis

material. It may be of interest to note that whenever possible—and for the most part it is possible only when there are attending social service problems—we are glad to assist the hospital physicians in research by seeing that the patient has long and unflinching follow-up care, and that he reports to special clinics and does whatever else the doctor may direct.

METHODS OF WORK

Weekly conferences with all members of the social service staff have been held throughout the year.

In an endeavor to serve the patients most wisely, and to build up understanding relationships with the departments within the hospital, conferences have been held from time to time with the heads of the medical services, who have been most helpful in relation to the work under their leadership. The weekly medical staff meetings have been very profitable and the director has appreciated the privilege of attending them. The administrative office has been extremely patient and helpful. The nursing office has never failed to give advice on mutual problems and, in the early spring, asked the director to give four interpretive talks to the head nurses, which gave us an opportunity to become better acquainted.

As regards teaching relations, frequent conferences have been held with the supervisor of the course in medical social service at the University.

Extra-mural relationships have been strengthened by conferences with heads of some of the organizations we work with most and with heads of the hospital social service departments of the Twin Cities. Annual meetings have been attended, and reports studied. Meetings of the Minnesota District of the American Association of Hospital Social Work have been attended regularly and all members of the staff, not formerly members of the organization, were encouraged to join it.

Meetings of the local chapter of the American Association of Social Work have been attended, for wider interpretation and information. The regional conference of the American Association of Hospital Social Workers was attended by the director and one member of the staff, and the National Conference of Social Work was attended by the director and another staff member.

PLANS FOR THE COMING YEAR

1. It is our belief that the department will improve its work through strengthening case work on all services and through special emphasis with the pediatrics service. One worker, especially trained in pediatric work, is, beginning July 1, 1930, to be responsible for all social service problems in conjunction with the pediatric clinic and all children in the hospital up to the fifteenth birthday.

Weekly conferences between the head of the pediatric medical staff, the head of the Social Service Department, and the staff worker on that service have already been arranged.

2. The social problems on the surgical and orthopedic services are to be placed with one worker, and Dr. Wangenstein has approved weekly

staff conferences between the orthopedic staff and the Social Service Department; and parallel conferences between the surgical service and the Social Service Department.

3. It is hoped that the medical service will approve either weekly conferences or the social worker's attendance on ward rounds.

4. I should like to develop further work with cancer patients, and have collected a good deal of data which I think can be used to advantage for this group of patients.

5. Each case worker should spend a definite period of time in conference with the workers in organizations she uses most. For instance, the orthopedic worker should be conversant with all the work in this state in conjunction with crippled children, the rehabilitation programs of the state, and the institutions which deal with the various types of handicapped patients involved. She should also know all available social resources, as well as indicated institutions. The worker on eye service should know all public and private resources in conjunction with her group of patients, the use of various funds, and all the educational programs for the blind and for those with defective vision. Each worker will then have some participation in developing resources. She will be stimulated by this educational and policy building program, and will further play her part in interpreting the hospital in which she works.

6. It is necessary to build up resources throughout the state. The Social Service Department feels the need of a better knowledge of what can be expected of the county commissioners and county doctors, and we feel we should work out with our own doctors a better system than we now have, for getting the discharge recommendations to whatever resources are available in the patient's local community.

7. I should like also to develop private resources through church groups, racial groups, and other units and, inasmuch as the university hospitals of Indiana and Michigan have done much in developing public and private resources on a state wide basis, I would like to visit their hospitals some time during the coming year.

8. I hope we may be able to work out a relief fund, to be used as gifts or loans for patients outside of Ramsey or Hennepin County whenever transportation, shelter, or medical relief is urgent, and cannot be met by the patient, or by the county from which he comes.

9. It would be desirable if the Social Service Department could do more in the direction of follow-up work, as some of the patients whom we know socially are the special concern of the physicians in charge; but this cannot come about until a general follow-up scheme is in operation.

Respectfully submitted,

FRANCES M. MONEY,
Director, Social Service Department

THE COLLEGE OF DENTISTRY

To the President of the University:

SIR: I submit herewith the report of the College of Dentistry for 1928 to 1930.

Curriculum.—Three classes have been admitted under the 2-3 plan of dental education, which was put into operation September, 1927. The two-year pre-dental requirement has brought a more mature, better prepared student into the College of Dentistry and has resulted in a higher scholastic average in science courses. The three-year dental course has crowded the work, especially in the clinical branches, and it is a question whether or not students will be able to attain the high standard of skill and proficiency in dental work in the three years which formerly were established under the four-year program.

The American Association of Dental Schools has received a grant of \$20,000 from the Carnegie Corporation to make a survey of the dental curriculum. The committee of the association will first make a survey of what a dentist is called on to do in the practice of dentistry and then build up what they consider a correct curriculum to be used in colleges of dentistry to prepare a student to render the service expected of him. Dental colleges are becoming more closely affiliated with medicine, so that dentists are becoming better prepared to practice dentistry as a health service.

Library.—The Carnegie Foundation for the Advancement of Teaching has given to the University the sum of \$1,500 for the purchase of additional books and periodicals on dental subjects.

Extension courses.—Co-operating with the state and local dental associations and with the General Extension Division of the University, short courses have been offered to practitioners. The two-year course in orthodontia has attracted capacity registration and favorable comments for making it possible for men in practice to secure the training which they wish in this specialty of the practice of dentistry.

Graduate courses.—Graduate dentists have been admitted from Norway, Sweden, and Australia, and degrees granted them. Their major study has been crown and bridge work and porcelain. These are branches in which Minnesota is especially well known.

School for Dental Hygienists.—The University of Minnesota was the first school to establish and put on the sound academic basis a two-year course for dental hygienists. The demand which we have for graduates of this course seems to justify its maintenance and further expansion. Most of the graduates engage in educational work in public schools, hospitals, and other institutions.

Faculty activities.—Members of the faculty occupy responsible executive positions in the work of the American Dental Association and in state and local associations. Lectures and clinics have been given by a large number of them throughout the United States and Canada on various

technical dental subjects. Four have received the honorary degree of Fellow in the American College of Dentists.

Research work.—Active research is going forward on several problems. On the subject of "The Cause and Prevention of Dental Caries," examination of the mouths of all freshman students entering the University the past two years has been conducted and a statistical report filed which has brought out a number of interesting and hitherto undiscovered facts concerning dental diseases. Research work on "Pathology and Classification of Tumors of the Mouth and Jaw" is being conducted by Dr. Carl W. Waldron and Dr. H. G. Worman. Several reports regarding their work have been published. Dr. G. A. Montelius is continuing his research work while with the Rockefeller Foundation at the Peking University Medical School at Peking, China.

New building for dentistry.—An appropriation was made by the legislature in the spring of 1929 providing for the construction of a new building for dentistry. On May 7, 1930, the Board of Regents chose as a site for the new building a portion of the south Medical School quadrangle of the hospital group on the corner of Union and Delaware Streets S.E. The state architect is now at work with plans for the building. This will provide for the College of Dentistry a modern, efficient building in which to conduct the work of the college in closer affiliation with the Medical School, which is a very desirable thing for the future progress of the dental profession.

Respectfully submitted,

W. F. LASBY, *Dean*

THE SCHOOL OF MINES AND METALLURGY

To the President of the University:

SIR: I herewith submit my report for the period July 1, 1928, to June 30, 1930.

Student mortality.—The total registration for the year 1928-29 was 134, and for 1929-30 it was 153. During the scholastic years, 47 students withdrew. The reasons for these withdrawals were as follows:

Financial	18
Scholastic deficiencies	20
Ill health	4
Transferred to other colleges	5

In addition to the above, 23 students who had been enrolled in the school failed to return the next year. As far as possible, we have been attempting to find out why they did not return. Our investigations gave us the following results:

Financial	14
Scholastic deficiencies	5
Unknown	4

It should be noted that 38 per cent of those leaving during the scholastic years left for financial reasons, while 61 per cent of those failing to return at the opening of the next school year were prevented from returning for the same reason.

Curriculum.—No changes have been made in the curriculum during the biennial period.

Attendance.—The enrolment of the school has increased from year to year. In spite of this fact, we still are unable to meet the demand for our graduates. This is particularly true in the field of metallography which at the present time affords a wonderful opening for thoroly trained men qualified for investigation and research along the lines of metals and their alloys.

SCHOOL OF MINES EXPERIMENT STATION

E. W. DAVIS, *Superintendent*

Newly acquired equipment.—No special equipment fund was available during 1929-30. A few items of equipment were purchased but most of the budget was spent for supplies.

1. *Equipment purchased.*—Among the items of equipment purchased during the year were typewriter, motor for Hummer electric generator, ball mill feed scoop, 14 lockers, Monroe calculator, Smith welding and cutting torch, new storage battery and tires for electric truck.

2. *Equipment constructed.*—Construction work in our own shops in-

cluded rebuilt portable belt conveyors, completed roofs on storage bins, bucket elevator, new variable speed drive for ball mill.

3. Loans.—Eight shaking screens for wet screening.

ACTIVITIES

Activities	1928-1929		1929-1930	
	No.	Gross Wt.	No.	Gross Wt.
Large scale tests ($\frac{1}{2}$ ton or more).....	9	336 tons	18	360 tons
Small scale tests (less than $\frac{1}{2}$ ton).....	3	1,400 lbs.	1	500 lbs.
Samples submitted for assay and examination	185		351	
Samples referred to other departments.....	10		10	

Attention is called to the fact that some of the time of the staff of the Mines Experiment Station, which is normally working on state service work, has been spent in connection with research activities. Also during the past year a portion of the laboratory has been used by the Bradley-Fitch Company on a special research problem of "*Leaching Cuyuna Range Manganiferous Iron Ores.*" The Portland Cement Association completed their special investigation on fine grinding of cement-making materials. A fine grinding and wet screening test was also made for the Western Electric Company.

Assays

The total number of assays made in connection with all work at the Mines Experiment Station during the past year was 13,573.

Publications

Mining Directory of Minnesota for 1930.—In addition to the state service work conducted under Mr. Wade's direction, we have continued our experiments with the production of iron from ore in the reverberatory smelting furnace. This experimental work was provided for by the last legislature through a special appropriation amounting to \$33,000 per year. The technical staff conducting this investigation consists of Mr. Craig, Mr. Firth, and Mr. Maehl. Considerable progress has been made during the past year. Methods of controlling the analyses of the metal have been determined, and about 100 tons of metal have been produced from Minnesota ores. The problem now is one of designing a furnace to operate efficiently. The fuel consumption in our furnace is high, but information is being developed to indicate that on a large scale the operation will be sufficiently cheap to be of commercial importance. During the next year, the experimental work will be along the line of furnace design and construction for efficiency of operation and simplicity of control.

UNITED STATES BUREAU OF MINES

The work of the North Central Experiment Station is conducted by six technical men and two skilled laborers, with Mr. T. L. Joseph, supervising engineer, in charge of the station.

The investigations conducted during the biennial period ending June 30, 1930, may be divided into two major problems: (1) utilization of Minnesota manganese iron ores in the production of ferromanganese, and (2) investigations of the basic principles involved in the conversion of iron ore into pig iron, in the blast furnace.

MANGANESE PROBLEM

The importance of developing methods for utilizing Minnesota manganese iron ores in the production of ferromanganese (the 80 per cent alloy indispensable in making steel) and the progress of experimentation were summarized in the *President's Report for the Year 1927-1928*. Since the brown manganese iron ores of Minnesota are essentially iron ores containing 8 to 10 per cent manganese, the method of attack has been to work out modifications in present iron and steel practice that will make it possible to recover the manganese as a by-product incidental to the normal production of steel and in a form suitable for producing an iron-manganese alloy containing 80 per cent manganese. Normally, this alloy is made in one operation involving the smelting of ores, containing from 45 to 50 per cent manganese, in the blast furnace or electric furnace. From 90 to 95 per cent of the ore used at present is imported.

Starting with Minnesota manganese iron ores containing only 8 to 10 per cent manganese in place of the normal 45 to 50 per cent, three major steps are necessary to arrive at the 80 per cent alloy. These steps are: (1) smelting a charge of 100 per cent manganese iron ore in the blast furnace; (2) treating the metal produced in step (1) in a basic open-hearth furnace or an electric furnace to produce a slag containing 45 to 50 per cent manganese and appropriate amounts of phosphorus and iron; and (3) smelting this high-manganese slag in a blast furnace or electric furnace to produce an alloy containing 80 per cent manganese. It should be noted that during these three major steps the iron content of the ore is converted into steel, a refined product that must furnish the major part of the financial return.

The present status of the problem is as follows: About 150 tons of metal have been produced in a six-ton experimental blast furnace in accordance with step (1). (See *Bulletin* No. 12, University of Minnesota School of Mines Experiment Station.) Most of this metal has been treated in a half-ton experimental open-hearth furnace, designed and developed by the bureau, and in a small electric furnace. (See *Technical Publication* 370, American Institute of Mining and Metallurgical Engineers.) Slag, resulting from step (2), is available for making the final step (3). During the coming fiscal year the bureau plans to operate the experimental blast furnace to carry on step (3) which will complete on a semi-commercial scale all of the important steps involved.

BLAST-FURNACE INVESTIGATIONS

This work has been divided into a number of interrelated problems. These problems are: (1) a study of the resistance which beds of irregular solids offer to the flow of gases; (2) the transfer of heat from gases to

beds of irregular solids; (3) the desulphurization of iron and steel by slags; (4) effect of cold and heat working upon the structure of iron ore; and (5) plant studies at commercial furnaces.

The object of these problems is to obtain data for formulating a quantitative conception of the blast-furnace process which has gradually evolved to its present state of development by empirical methods. Few fundamental data are available on any of the above problems. Results from problem (1) may be cited to show the application of fundamental data to the blast furnace and other industrial operations. The relation between the sizes in a bed of irregular solids and the density of the bed was developed in connection with this problem. Such a relation can be readily applied to the blast furnace, the capacity and efficiency of which is limited by the pressure developed in forcing large volumes of gases through a 70-foot column of ore, coke, and limestone. It can also be applied to the proportioning of concrete aggregates to obtain maximum density; to the crushing of the coal charge for coke ovens inasmuch as the capacity of the oven depends upon the density of the coal mixture; and to the shaft-type lime kiln in which gases are circulated through beds of limestone.

Transfer of heat from a gas stream to beds of solids is related to the manner in which various sizes nest together in a bed. This problem is closely related to number (1). The extent to which iron ore breaks down to smaller sizes in the blast furnace is obviously related to both problems (1) and (2). Practice indicates some ores break down more than others but no conclusive data are available. This problem will indicate which ores should be sintered in line with the program of sizing and sintering which has been advocated by the bureau. Observations in the field upon the conditions existing in the interior of the blast furnace are invaluable in applying the data obtained from fundamental laboratory studies.

SERVICE TO THE MINNESOTA TAX COMMISSION

E. M. LAMBERT in charge

Object.—The School of Mines and Metallurgy still continues its service to the State Tax Commission. The ore estimates, as checked and submitted, are used as a basis for the valuation of mineral properties in the state of Minnesota.

Services.—Owing to the fact that our biennial report to the Minnesota Tax Commission is due September 1, 1930, and will include the work of the summer of 1930, and also to the fact that no information covering our last biennial report to the State Tax Commission appears in the last *President's Report*, this report will cover the activities for the period, September 1, 1926, to August 31, 1928.

During this period the School of Mines and Metallurgy made reports to the Tax Commission on a total of 168 properties. These reports covering properties of the three iron ranges involve a total of 496,062,425 tons of bessemer, non-bessemer, and manganiferous iron ores. This is a net increase of 58,113,091 tons over our previous reports on the same properties.

In addition to the above tonnages, we reported 64,001,659 tons of non-merchantable ore. Factors in determining the merchantability are: size of ore body; depth at which ore occurs; isolation; analysis; physical structure; and cost of production. Much of this ore may eventually be placed in the merchantable class and taxed as such. This change in classification will depend on many factors. Changes and developments in blast furnace practice may remove existing prejudices against certain types of ore, or even make them highly desirable. This is well illustrated by conditions on the Cuyuna Range, where at one time only straight iron ore was mined, manganese being considered a detriment. Today this range produces principally manganiferous iron ore. Improved machinery or development of new methods of mining or beneficiation may reduce the cost of production to a point where some of this ore can be placed on the market at a profit. The use of "slushers" or scrapers in loading ore in underground mines and the use of the larger types of steam and electric shovels in open pit mines have reduced the number of men working in the mines and increased the number of tons of ore produced per man. This, of course, means cheaper production. New processes of beneficiation may be developed to reclaim some of the ore. Introducing crushers ahead of the washers in some of the washing plants has helped to reduce the silica content to a point where the product may be sold without penalty. Jigging, which up to the present time has been more or less of an experiment, seems to be gaining ground.

Of the total iron ore shipped from Minnesota during the last four years more than one third is a beneficiated product. In 1927 this product amounted to 13,500,000 tons of which crushing and screening produced 8,400,000 tons; washing 4,800,000 tons; and jigging, sintering, and drying about 300,000 tons.

In the crushing and screening plants, the grade of the ore is improved slightly by the elimination of coarse rock, but the structure is considerably improved by the crushing of the large lumps. This is the most simple of the beneficiating processes and accounts for the largest proportion of the ore that is treated. Due to the fact that blast furnace operators are beginning to recognize the value of sized ore in their furnaces, there will probably be a gradual increase in the future in the amount of ore that is crushed and screened to definite sizes. This method has not resulted in changing the classification on any appreciable tonnage of non-merchantable ore to a merchantable class. The ore would, in all probability, have been used even without crushing but might not have been as desirable. There are about ten crushing plants operating in the state.

In 1928 there were in operation about fifteen washing plants of various sizes and capacities using various methods. An approximate average iron and silica content of all crude ore washed in the state is 44 per cent iron and 30 per cent silica. In the crude state this material was worthless from the standpoint of present blast furnace practice. The ore that is amenable to washing must contain the silica in the form of fine sand. If it so occurs and is not locked between bands of high grade ore, a good separation may be obtained by the various methods employed. In wash-

ing the above ore an average of 65 per cent of the tonnage treated may be recovered in the form of a very desirable high grade concentrate containing approximately 57.5 per cent iron and 11 per cent silica. Some crude ore treated contained as low as 30 per cent iron and a correspondingly high percentage of silica. This material when washed resulted in a lower tonnage recovery but in a satisfactory finished product. In the past few years the operators have begun to crush the crude ore and so release some of the fine sand held between the finer bands of ore.

The available ore that can be concentrated in standard washing plants is being gradually depleted. However, improvements are being made in the equipment of the washing plants which make possible the economic handling of the leaner wash ores. Future developments will probably bring into existence many plants in which washing is used as one step in a more complicated method of concentration.

When the silica has not been altered to a fine sand by the natural leaching influence of water, but is contained as bands of hard cherty material alternating with bands of high grade iron ore, it may in some cases be separated from the iron ore by means of crushing, sizing, and jigging. There are two jigging plants in the state, one has been in operation for five years and one has just been completed. An approximate average performance has been to treat a worthless crude ore containing 45 per cent iron and 30 per cent silica and produce a concentrate containing 55.5 per cent iron and 10.5 per cent silica. The concentrate amounts to 50 per cent of the crude ore treated. This recovery will probably be increased.

Jigging has been attracting much attention among operators on the ranges. Considerable experimental work has been done with this method of concentration and, altho the amount of ore treated on jigs at the present time is small, this method of concentration will undoubtedly make available a large tonnage of ore that is not of much value at the present time. The process will probably be of the most value in connection with washing plants in which coarse silica is present in the wash ore concentrate.

Drying, as a means of beneficiation, consists of taking an ore, with the moisture content so high as to make the natural iron content so low that it takes a penalty in marketing, and driving off a part of the moisture by the application of heat. There are at the present time two drying plants in the state. Several others have been in operation but have been dismantled. The only drying plant operating on an iron ore takes a crude ore containing approximately 54 per cent iron (dried), 17.5 per cent moisture with a 44.55 per cent natural iron and makes a product that contains 54.5 per cent iron (dried), 9 per cent moisture with a 49.6 natural iron. Drying is not an economic process unless enough moisture is driven off so that the freight saved on the moisture will pay for the drying. When this is not accomplished, the only excuse for drying is to save the penalties inflicted by the present method of fixing the values of iron ore on a natural iron basis irrespective of the nature of the gangue material. The drying of the ore produces a large amount of dust. The moisture, unless very excessive, could be driven off in the upper part of the blast furnace by the waste heat without any extra fuel cost.

Sintering, however, has a twofold objective, viz., improving the structure by agglomerating the fine particles and driving off the water and other volatile constituents.

Of the two sintering plants in the state only one has been in operation the past few years. During the season of 1928, 111,000 tons of sintered ore were produced in the state as compared with 18,000 tons in 1927. The future of drying and sintering can hardly be foreseen at the present time.

The factor which will tend to put more non-merchantable ore in the merchantable class than any other is "the law of supply and demand." As the present reserves of high grade ore near depletion, the operators will naturally renew their efforts in developing methods of beneficiation or blast furnace practice whereby the low grade ores may be utilized, unless it is cheaper to import foreign ores.

Seven trips, requiring forty-one days of field work, to the mining districts of Minnesota were taken by two men. The field work consisted of inspecting properties, securing data, and holding consultations with mining officials and reviewing their estimates.

Two men devoted their full time during the six summer months of the biennium while one man devoted part time for sixteen months to carry on the field and office work.

The methods employed by us in checking the estimates of the mining companies are in accordance with the standard practice of the particular district in which the property is located. Each property is considered as a unit on its own merits. The available information on adjoining properties, however, is given some consideration.

It is obvious that a large amount of field work must be done to carry on the work successfully. This is necessary in order that personal examinations may be made of the properties and mining conditions, that details of estimates may be studied and discussed with the proper officials, and that our staff may keep in touch with the mining industry and its progress. Field work is especially necessary when operating properties are to be considered.

STAFF

Mr. E. M. Lambert, professor of mining engineering, remains in charge of the work, assisted by Mr. L. S. Heilig, associate professor of mine plant and mechanics. During the summer of 1927, due to a vacancy occasioned by the resignation of Mr. A. J. Carlson, Mr. R. W. Allard of the Department of Metallurgy assisted.

ACKNOWLEDGMENT

The hearty co-operation of the officials of the various mining companies is evidence of the cordial relations existing. Many expressions of appreciation of this branch of service to the state come to us, both from the mining companies and the staff of the Tax Commission.

Respectfully submitted,

W. R. APPLEBY, *Dean*

THE COLLEGE OF PHARMACY

To the President of the University:

SIR: I beg leave to submit this biennial report covering the period from July 1, 1928, to June 30, 1930.

Advancement of standards.—The biennium has been a fairly successful one for the college. By action of the Board of Regents on April 1, 1926, the college abandoned its regular minimum three-year course and made the old optional four-year course the regular minimum one. The past two years have been devoted to strengthening this course and it is likely that several more years will be required to make the course adequately operative and practically and consistently standardized. The increased requirements have entailed practically no decrease in enrolment as had been expected. This fact is probably due in a large measure to the co-operation of the pharmacists of the state through the state association. The pharmacists asked the Board of Regents in 1917 or 1918 to carry out the request of the faculty previously made for the establishment of a minimum four-year course in pharmacy. When year after year passed without the board taking the requested action, the pharmacists became more and more dissatisfied with the situation and threatened to go into the legislature to have the four-year course established by legislation. This I succeeded in averting twice on the basis of my conviction that the regents would meet the request in due time because it was based upon a real and generally recognized necessity. When early in 1926 the regents granted the advancement to the four-year minimum course, the pharmacists immediately took steps to require all future practitioners to obtain a training represented by the new course, and so they requested legislation to that end and succeeded when the Legislature of 1929 passed two acts of much importance to pharmaceutical education and practice. The one act made graduation in pharmacy a prerequisite to application for examination and licensing by the State Board of Pharmacy. The other abolished the status of the assistant registered pharmacist, a status which had always tended away from adequate standards. The pharmacists had reached a state of mind where they refused to procrastinate longer in their decision to place pharmacy upon an adequate educational and practical standard in Minnesota—a standard which had long been advocated by the college but which had been opposed by a minority of pharmacists who were more commercially than professionally inclined. Some of the few dissatisfied pharmacists have again demanded, since the enactment of the graduate requirement, that the college provide instruction in so-called commercial pharmacy including window trimming and salesmanship. The college, of course, will never ask the regents to permit the inclusion of such courses in the pharmaceutical curriculum. The demand is made by comparatively few pharmacists and is opposed by the majority, including the leaders. The minority introduced a resolution in the February, 1930 convention of the Minnesota State Pharmaceutical

Association advocating the consideration by the college of commercial courses in pharmacy. This request was made frequently in the past and always subsided when the explanation was made that the University now affords any kind of business instruction that merchants or others might be likely to desire. In this connection it is worth stating that one of the formerly most impetuous and influential advocates of commercial training in the College of Pharmacy, and who in past years was a critic and a leader of critics of the college because it did not comply with his desires, has of late changed his mind entirely and is championing the position of the college against commercial instruction. At the recent meeting of the Minnesota State Pharmaceutical Association he sided strictly with the college.

The periodical requests for commercial training in the College of Pharmacy and their regular subsidence are due to the twofold activities carried on in the average drug store. While not much objection has been raised in the past against a reasonable amount of merchandising in drug stores, the present overcommercializing and the corresponding submerging of professional practice in some stores have reached the point of reaction, and an ever accelerating number of pharmacists are separating from the dual activity, giving their time wholly to professional practice or wholly to commercial. Those who devote themselves exclusively to professional practice, of course need adequate professional training and so do those who still carry on the dual activities. The college is, therefore, still concerned wholly in the professional training of pharmaceutical practitioners, in which purpose it has always been supported by the administration. For thirty-eight years the college has gone forward with that aim in view. It was established for that purpose by the state. It should continue to go forward with the same high purpose and it can well afford now and in the future to remain undisturbed in the face of unreasonable outside demands.

Higher standards in the future.—The college was the first of all colleges which went to the minimum four-year basis on their own initiative. The College of Pharmacy of Ohio State University preceded it a few months but not because the college or the pharmacists of Ohio wanted or asked for higher standards but because the president of the University suggested them. More than twenty-five years ago the college advocated before the American Conference of Pharmaceutical Faculties a minimum four-year course, but without one single source of support at the time and with much opposition and criticism and even denunciation. The culmination of this pioneering work, begun so many years ago, in the recent adoption of the present standards, augurs well for even higher standards in the future. The college is already concerning itself with reasonable advancement in the not too distant future. This advancement will come about in a perfectly natural way and is already indicated by the pleasing fact that an appreciable number of students complete the junior college in their home town or near their home town before taking up the technical work in pharmacy. That is, they are voluntarily taking one year more of academic studies than are required in the present four-year course. They graduate

at the end of five years. Exactly half of the 1929-30 entering class completed the equivalent or more of the junior college. The added year of academic preparation serves to make the graduate much more capable generally and professionally and thus creates a distinct advantage to the people of the state who need pharmaceutical service. When a sufficient number of students voluntarily completes two pre-pharmaceutical years, the profession of pharmacy will probably request that five years above the high school should become the minimum preparation for graduation and state examination.

Graduate work.—While the college has constantly advocated in the past the development of graduate work in pharmacy, it feels that its real work still is in the development of the field of undergraduate work. It, therefore, advocated two years of academic preparation rather than only one year of such preparation and one year of graduate work after completion of the present four-year course. The college is equipped and manned, in a still somewhat limited way, to offer graduate work under the direction of the Graduate School leading to the degrees M.S. in pharmacy and the Ph.D. in the science fields of pharmacy; but it does not encourage the development of graduate work at the expense of the adequacy of the lower work as one or two other universities are inconsistently doing.

The development of graduate work in pharmacy is progressing in a number of universities, but the American Association of Colleges of Pharmacy has not as yet included graduate work in its development program. It is likely that the association will develop some such program soon. For the present it is holding its members to the establishment and development of the four-year course. By resolutions of the association, every member college must be on the four-year basis by 1932. Many are already on that basis and no doubt all will have reached that standard by 1932. The colleges of pharmacy of the state of New York withdrew from the association in protest against its requirement of the minimum four-year course. No doubt the five colleges in New York State will return to the association when they will have found it possible to meet the association standards. I mention all this not in disparagement of graduate work in pharmacy but in support of the need of further development of undergraduate work. The college is, therefore, giving its primary attention to its regular work and giving such time and attention as it can to the increasing demands for graduate work.

Teacher training.—Because the colleges of pharmacy constituting the membership of the A.A.C.P. are all to be on the minimum four-year basis by 1932, the demand for teachers in the various fields of pharmacy has increased greatly, and because of the standing of this college, many requests are received for its graduates. The faculty of one college is made up entirely of graduates of this college. Very few graduates, however, have prepared themselves definitely for instructional work. The standard of instructional capacity is continually increasing and some colleges of pharmacy will henceforth employ only those who have earned the Ph.D. degree or are well on the way toward that degree. No college is affording oppor-

tunities at the present time for the training of teachers in pharmacy and possibly in a few years it may become advisable for this college to create opportunities, perhaps through arrangement with the College of Education, for teacher training for the better teaching of the subjects covered by the pharmaceutical curriculum.

Training in manufacturing pharmacy.—Pharmaceutical and chemical manufacturers and manufacturers in related fields are employing graduates in pharmacy in larger numbers than formerly and it is likely that in the near future a demand may be created for graduates who have specialized in manufacturing. When and if that demand should arise, the college would have to take it into consideration as part of its future program. In this connection it may be of interest to know that graduates in pharmacy are found in many positions outside of the drug store. The *American Druggist*, a pharmaceutical monthly journal of note, recently made a survey showing that the training which the good college of pharmacy now affords enables its graduates to hold sixty kinds of positions in pharmacy and closely related fields. This survey is of considerable interest to pharmaceutical education but in analyzing it, no reason is discovered why the colleges of pharmacy should change their present curricula now or in the near future except possibly in the respects mentioned above, namely: to train teachers and manufacturers.

College relations with organized pharmacy.—Because of the front rank position occupied by the college, it is profitable as well as necessary to maintain and continue its many affirmative contacts. Among these contacts are principally:

1. *The Minnesota State Pharmaceutical Association*, whose Scientific and Practical Section program is provided annually by the college and whose secretaryship is filled by a member of the faculty and a number of whose important committees have college representation and whose Committee on the College of Pharmacy has been helpful in relationships with the college for the past thirty-seven years;

2. *The American Association of Colleges of Pharmacy*, in whose deliberations and activities the college has taken a most active interest from the beginning and through whom the college has pioneered and launched important advancements in educational standards;

3. *The American Pharmaceutical Association*, with whom the college has co-operated in all matters relating to the national aspects of pharmaceutical education, legislation, and practice;

4. *The National Association of Boards of Pharmacy*, with whom the college has worked for many years now for better state examinations and practical standards and whose joint work with the American Association of Colleges of Pharmacy and the Section on Education and Legislation of the American Pharmaceutical Association, the college has always supported actively and effectively;

5. *The Minnesota Pharmaceutical Educational Conference*, which is made up of the State Board of Pharmacy, the college executive faculty, and the Education Committee of the Minnesota State Pharmaceutical As-

sociation, and whose function is to administer jointly and co-operatively upon Minnesota pharmaceutical problems falling within the spheres of influence of the three bodies and whose work and influence are clearly perceptible in the more harmonious working together of the three chief Minnesota pharmaceutical educational factors;

6. *The American Association of Colleges of Pharmacy and the National Association of Boards of Pharmacy joint regional meetings*, whose work is in fields between state and national problems and whose annual meetings, the last of which was held here in Minneapolis in February, 1930, are definitely conducive toward the harmonizing and standardizing of pharmaceutical affairs in each of the nine districts into which the United States is divided for the purpose and of which the states of Minnesota, Iowa, North Dakota, South Dakota, Kansas, and Nebraska constitute District No. 4;

7. *Plant science seminar*, which originated here at the college through Dr. E. L. Newcomb and which has become national in its scope and activities and whose work is principally in the field of medicinal plant science;

8. *Educational conferences*, of which there are four, held annually, usually concurrently with the American Pharmaceutical Association meeting and covering the study fields of pharmacy, pharmacognosy and materia medica, chemistry and economic pharmacy and which conferences are distinctly helpful in advancing the standards of courses and the qualifications of instructors;

9. *The World Conference on Narcotic Education*, with whom the college has co-operated in the work in education looking toward the mitigation, controlling, and ultimate eradication of the narcotic evil;

10. *National Wholesale Druggists' Association*, through whom the college has obtained advantage by supporting and utilizing the various surveys made in the field of pharmaceutical merchandising and distribution;

11. *Druggists' Research Bureau*, functioning under the auspices of the National Wholesale Druggists' Association and which has issued many bulletins and case studies covering the conduct of business in average drug stores and to whom the college has given co-operation through the submission of information on prescription and pharmacopoeial medicinals obtained through numerous questionnaires filled out by alumni of the college and by other pharmacists;

12. *National Conference on Pharmaceutical Research*, which holds meetings annually and which in the interims engages, through its association and individual members, in extensive and comprehensive research in practically all fields of pharmacy and to whom the college has given substantial assistance through the work of three of its faculty members;

13. *U. S. Pharmacopoeial Convention*, whose function it is to revise every ten years the U. S. Pharmacopoeia, a task which requires the highest quality of scientific work of fifty experts and at least an additional two hundred competent workers through a period of about six years, and whose revision work is shared by members of the college and the administrative functions of whose board of trustees are shared by one of the members of the faculty;

14. *National formulary revision*, a very important part of which is being done by a faculty member as a member of a leading committee;

15. *National Pharmaceutical Syllabus*, whose purpose it is to publish and revise from time to time a syllabus of pharmaceutical studies for the guidance of the colleges of pharmacy of the country and one of whose chapters was written by a faculty member who also has been a syllabus member for many years;

16. *American Medical Association*, at whose Minneapolis meeting and exposition at the beginning of the biennium the college conducted a representative professional pharmaceutical exhibit and for which the first prize in the Section on Education was awarded to it;

17. *Hennepin County Medical Association*, before whom a member of the faculty gave an address in 1928, which address was published in several medical and pharmaceutical journals and reprinted to the number of five thousand and distributed among as many physicians and pharmacists throughout the United States;

18. *Northwestern branch of the American Pharmaceutical Association*, whose headquarters are in the Pharmacy Building and whose several program meetings annually are contributed by the faculty and student body of the college;

19. *Minneapolis Retail Druggists' Association*, whose professional meetings the college has supported in the past in numerous ways including the giving of occasional addresses by a member of the faculty and whose contributions toward the development and welfare of Minnesota pharmacy, and especially of Twin City pharmacy, was signally recognized by the association by the gift of a purse of \$1,144 to said faculty member in November, 1929.

As soon as all the recognized colleges of pharmacy will have gone upon the four-year basis, the faculty standards of this college will not be as far above the standards of other colleges as has been the case in the past and it may become necessary, in a few years, to strengthen the present faculty either by additions or replacements or both. The college must maintain its standing and leadership among American colleges and to that end it may have to give attention, before many years, to strengthen its instructional forces as stated above.

Faculty publications.—These have been reported separately to the president's office.

Research.—During the biennium the college did an appreciable amount of real worth while research, particularly with digitalis assay methods, medicinal plant growth stimulation, medicinal plant culture, and in education surveys.

Medicinal plant culture.—The old drug plant garden was abandoned two years ago to make room for the erection of the Cyrus Northrop Memorial Auditorium. In its place the college was given the botanical garden and plant house system on University Avenue which formerly belonged to the Department of Botany of the College of Science, Literature, and the Arts. One of the wings of the greenhouses was converted into a slat house for

shade loving plants and all necessary changes in garden arrangement and soil preparation and adaptations were made to meet the needs of drug plant culture.

The medicinal plant culture carried on is sufficient only for the needed educational facilities including a limited amount of research. Many demands from outside sources are made upon the college for cultural information and instruction, for seeds and plants and plant parts, for advice relating to the economic aspect of drug plant culture in this climate. Much of the desired information cannot be given without experimental or research work extending over several years and for which the college has not the time, grounds, nor equipment. It may be that if this demand increases sufficiently the college should, in the future, be empowered by the University and by adequate initial legislative appropriations and annual appropriations to carry on work along the lines of a pharmaceutical experiment station. I have mentioned this matter before but now as then I have not the full conviction of the advisability from an economic or from an expense point of view, of such an undertaking in this climate.

Recently the Department of Agriculture, Washington, D.C., made a second survey of the collegiate medicinal plant gardens and for the second time gave our garden first place.

Special lectures.—The college kept up its practice of many years past of bringing to the students lecturers or experts in special fields of science and commerce related to pharmacy. In addition the students were given the usual annual opportunities of listening to the programs of the Scientific and Practical Section of the Minnesota State Pharmaceutical Association which always include lecturers of note, usually of national prominence.

Moving and still pictures.—The limited use of these pictures in instructional work during the past few years, especially during the biennium, has proven satisfactory. It would be profitable to increase the employment of this aid to instruction, in the coming years, and possibly the talkies too as they become more perfect and less expensive.

Special equipment.—Some needed apparatus and instruments of precision were acquired. These additions have somewhat increased the college facilities for graduate work. The installation by the Buildings and Grounds Department of a distilled water system for all of the main laboratories has proved a very valuable addition to the various laboratory facilities. An air and gas pressure system is needed and is now under consideration by the department.

Instructional trips.—The students made the usual botanical field trips and visits to manufacturing, milling, and wholesale houses under the competent guidance of instructors.

Scholarships.—The college has only one scholarship to offer, that of the M.S.P.A. amounting to \$105 annually. Despite the best efforts of the faculty to interest alumni and pharmacists and others, no interest has so far been aroused toward other and more worth while scholarships. However, efforts will not be relaxed.

Student helpers.—Ever since the college has been established, it has employed students to give an assisting service to the laboratory departments. This practice grew out of the need for economy. It is of advantage to the student helpers because it helps them pay their way in part, but more particularly because it affords them valuable experience. The advantage to the college is less. The helpers have to be broken in annually and their services are naturally limited in scope and quality. Possibly in due time the student helpers can be replaced, gradually, with full time service men, or assistants. No request in that respect is made at this time.

Buildings.—The need of more room is increasing. Except in that respect the building situation is the same as reported in the past several years. A new building or preferably an addition to the present Pharmacy Building will be needed when the present enrolment will increase which may be very soon.

Co-operation with other university departments.—The demand for pharmaceutical service from other university departments has not diminished. The college has furnished medicinal preparations to the University Hospital, the Out-Patient Department of the hospital, University Health Service, Department of Pharmacology, Dental College, University Farm Veterinary Department, Institute of Child Welfare, Athletic Department, Chemical Storehouse, Crookston, Morris, and Grand Rapids stations. (See supplement to this program: a radio talk over WLB on "The Service the College of Pharmacy of the University of Minnesota Is Giving to the State.")

Respectfully submitted,

FREDERICK J. WULLING, *Dean*

THE SERVICE THE COLLEGE OF PHARMACY OF THE UNIVERSITY OF MINNESOTA IS GIVING TO THE STATE

The Eighth of a Series of Radio Talks on "The Pharmacists' Relation to the Public" over WLB (University Station)

BY FREDERICK J. WULLING

The service which the College of Pharmacy gives to the state is both indirect and direct. The former is by far the more extensive. The service will therefore be stated under: Indirect and Direct, according to the following synopsis:

INDIRECT SERVICE

- | | |
|--|-------------------------------------|
| 1. Educational | 5. The scientific section, M.S.P.A. |
| 2. Pharmaceutical progress | 6. Service to the U. S. Government |
| 3. Co-operation with other pharmaceutical bodies | 7. The medicinal plant garden |
| 4. The college prerequisite | 8. Research |
| | 9. U. S. pharmacopoeial revision |

DIRECT SERVICE

- | | |
|--|--|
| 1. Medicinal preparations to other university divisions | 4. Advice upon drug plant culture |
| 2. Analyses and identification of items sent the college | 5. Research |
| 3. Professional advice to pharmacists | 6. Service to the Minnesota State Pharmaceutical Association |

INDIRECT SERVICE

1. *Educational.*—The college serves the state primarily by training students to become safe and competent practitioners of pharmacy, who in turn contribute efficiently, with the medical practitioners, toward restoring or maintaining the health of the citizens and since good health is the chief asset of a commonwealth, this service is, with medical service, a paramount one. The educational service the college has given the state since its organization by act of the Legislature in 1891 has always been of a high standard, a standard which has never been exceeded in any other state and approached or equalled by only very few states. The college has always kept its standard high because of its recognition of the serious responsibility inherent in the practice of pharmacy and which practice is the activity of the major medical specialty.

2. *Pharmaceutical progress.*—The college has always kept abreast of pharmaceutical progress which has been admittedly very rapid and accelerating, especially during the past two decades, and in important respects the college has promoted and stimulated this progress and development. It has materially assisted other colleges of pharmacy toward better courses and instruction and has always been a leader in the upward work of the American Association of Colleges of Pharmacy and thus has given an indirect service to other states and indeed to other nations, some of which have followed or utilized the educational work of the association as well as of the college.

3. *Co-operation with other pharmaceutical bodies.*—In its more domestic work in the state, the college has always enlisted consistently and successfully the co-operation of the Minnesota State Pharmaceutical Association, the State Board of Pharmacy, and the local and county pharmaceutical associations. This co-operation and joint work long ago resulted in placing pharmacy in Minnesota into the very front rank, according to the judgment of other than Minnesota pharmacists. This co-operation enabled the college to be the first to offer a voluntary three-year course, to be the first to establish somewhat later the obligatory three-year course, and to be the first to establish upon its own initiative the obligatory four-year degree course in 1926, and to be one of the first to offer voluntary five- and six-year and longer courses for those who want to specialize in any of the divisions of pharmacy.

4. *The college prerequisite.*—The college initiated and led the movement of putting upon the statutes of the state the so-called pharmacy college prerequisite which made attendance at a college of pharmacy a prerequisite to application to the State Board of Pharmacy for examination for license to practice. This was the most important forward step taken by Minnesota pharmacy and resulted in a vast improvement in practice enhancing materially the professional service rendered the state.

5. *The scientific section, M.S.P.A.*—Another significant upward step taken by the college was the establishment, at its initiative, of a scientific and practical section within the state association. This section, since its organization over twenty years ago, presented, interpreted, and broadcasted to Minnesota pharmacists, through the college faculty, every advancement and development of American pharmacy. No other faculty renders a comparable service in this respect. This service has placed and kept Minnesota pharmacy in the very forefront among the states and has given the college a recognition not accorded to any other in this respect.

6. *Service to the United States Government.*—The United States Government gave the college a substantial recognition during the late war by twice calling to Washington one of its faculty to advise in formulating the war courses in pharmacy and by selecting the college to prepare for the War Department all of the tincture of digitalis needed by the Medical

Corps. The college prepared and physiologically standardized over twenty-one thousand bottles of the tincture which was distributed to all divisions of the army in this country and in Europe. The government expressed its recognition of this service by designating it as an important and noteworthy one.

7. *The medicinal plant gardens.*—Another important indirect service to the state grew out of the enlargement of the medicinal plant garden in 1910, in that the cultivation of over three hundred species and varieties of medicinal plants enabled the college to improve and expand its educational facilities very materially. The garden also made it possible to give many citizens a direct service, but this will receive attention in a following division of this article.

8. *Research.*—The considerable research which the college has done for many years amounts to an indirect service of wide scope and importance in the respect that it contributed and contributes materially to the advancement of scientific and professional pharmacy and hence to the advantage of better public health. The research with *digitalis* alone, which a member of the faculty and his associates carried on since 1910, has been recognized not only in this country, but in Europe, India, Persia, Afghanistan, and South Africa, and as a result the college is furnishing *digitalis* of its own production to pharmacists in many of our states and abroad who have physician's prescriptions calling for University of Minnesota grown and standardized *digitalis*. At present a German pharmacologist is engaged in comparing the therapeutic value of our *digitalis* with other productions and according to a recent report, he has found none to equal it.

9. *U. S. Pharmacopœial revision.*—Another indirect service the college is giving, is its participation in the decennial revisions of the U. S. Pharmacopœia. During the six years that were required to revise the present tenth revision, and which became official on January first, 1926, practically every member of the faculty gave a considerable expert service and two members gave a conspicuous service respectively as member of the revision governing body and board of trustees, and as chairman of one of the major committees having charge of the extensive work of revising an important division of the Pharmacopœia. The U. S. Pharmacopœia is recognized as the foremost work of its kind in the world.

THE COLLEGE OF EDUCATION

To the President of the University:

SIR: As dean of the College of Education I have the honor to present the following report for the biennium 1928-30.

The outstanding event of the biennium for the College of Education was the celebration, in April, 1930, of the twenty-fifth anniversary of the founding of the College of Education. The Minnesota State Legislature at its session in 1905 passed a bill authorizing the Board of Regents to establish a College of Education. On December 12, 1905, the Board of Regents voted to establish such a college with a two-year course and a three-year course, each beginning with the junior year. Dr. George F. James, professor of pedagogy from 1901, was made dean of the college, and Mr. A. W. Rankin was appointed professor of education. Miss Jean Alexander, instructor in education, is authority for the following facts concerning education at Minnesota at this date:

At the time the College of Education was established there were ten colleges in the University with 140 professors and 3,900 students. There were 53 acres in the campus, and buildings and equipment were valued at \$2,000,000. The "New Main Building" was in process of construction at a cost of \$400,000.

Throughout the state there were enrolled in the common school districts 430,000 pupils, 55,000 of whom did not attend long enough to be included in the apportionments of state aid. The average school session was 7.3 months, the average pupil attendance 87 days. For the 180,000 children in special and independent districts there was a 9-month session. Men in the common school districts received \$47 a month, women \$37, while in the independent and special districts men received \$101 and women \$48. The school fund was valued at about \$18,000,000 and provided about 7 per cent of the school revenues. There were 20,000 high school students enrolled in 174 state-aided high schools. Students in normal schools numbered about 2,800.

Two years later the Board of Regents established a practice school offering work in the seventh and eighth grades. This school was extended in 1911 to include all grades up to and including the tenth and came to be known as the University High School. After some time the work of the seventh and eighth grades was dropped and the school remained a four-year high school until 1928 when it was reorganized as a junior-senior high school with Dr. Charles W. Boardman as principal.

The action of the state legislature in 1905 has been taken as the date of the founding of the College of Education, altho courses in education had been taught more or less continuously from 1881 when Professor Maria Sanford gave a course of ten lectures on the "Theory and Art of Teaching."

In celebration of the twenty-fifth anniversary the meetings of Schoolmen's Week were organized with a view to giving some picture of the development of education in Minnesota during recent years, and particularly

of the twenty-five-year period just lapsed. The following program represents the list of speakers and the subjects discussed.

APRIL 16

- 9:30 a.m.—General Topic—Education and the New World
Men and Machines—Stuart Chase, Author and Economist, Labor Bureau, New York City
The Revival of Personality—E. H. Lindley, Chancellor, University of Kansas
New Problems in Education—W. J. Cooper, United States Commissioner of Education
- 2:00 p.m.—General Topic—Educational Pioneering in Minnesota
The Schools of Minnesota in the Last Quarter of the Nineteenth Century—Livingston C. Lord, President, Eastern Illinois State Teachers College
Development of Secondary Education in Minnesota—George B. Aiton, formerly High School Instructor in Minnesota
The Increasing Professionalization of Educational Workers—Fletcher Harper Swift, Professor, University of California, and formerly Professor of Education, University of Minnesota
- 8:00 p.m.—All Minnesota High School Chorus
- 8:30 p.m.—General Topic—Educational Trends in Minnesota
For the State Department of Education—Commissioner J. M. McConnell
For the University—President L. D. Coffman

APRIL 17

- 9:30 a.m.—General Topic—The University School of Education
As an Institution for the Professional Training of Educational Workers—M. G. Neale, Dean, College of Education, University of Missouri
As a Center for the Development of a Science of Education—C. H. Judd, Professor and Director, School of Education, University of Chicago
As a Source of Educational Leadership—W. C. Bagley, Professor, Teachers College, Columbia University

APRIL 18

- 9:30 a.m.—General Topic—Public School Administration
State School System: Vocational Education in an Industrial State—A. B. Meredith, Commissioner of Education, State of Connecticut
City School Systems—G. D. Strayer, Professor, Teachers College, Columbia University
Forces Behind Education in Europe—Paul Dengler, Director, Austro-American Institute of Education, Vienna, Austria

The papers presented at this meeting have been collected and are being edited by Assistant Professor Alvin C. Eurich with a view to publication in an anniversary volume by the University of Minnesota Press.

ALUMNI DINNER

In addition to the formal program as outlined above, the faculty and students co-operated with the alumni in a student-faculty-alumni banquet held in the ballroom of the Nicollet Hotel on April 15. Eight hundred guests attended.

MINNESOTA MENTOR

The spring quarter issue of the *Minnesota Mentor*, the publication of the students in the College of Education, was enlarged and carried material relating to the growth of the college.

Subsequently Miss Alexander prepared a memorandum concerning the

life and educational activities of David Kiehle, who was conspicuous in the early educational history of the state, being at different times state superintendent of public instruction (1881-1893), member of the Board of Regents ex-officio (1881-1893), and finally serving as head of the Department of Pedagogy in the period immediately prior to the establishment of the College of Education. Miss Alexander's sketch of Dr. Kiehle reveals one of the notable characters in Minnesota education—a statesmanlike pioneer in the development of higher education and in the training of teachers.

GROWTH OF THE COLLEGE OF EDUCATION

For the anniversary issue of the *Minnesota Mentor*, Dr. Victor Noll prepared a paper on the growth of the College of Education. This paper will be republished in the anniversary volume and may only be referred to here. The growth of the college is shown by the fact that the average annual enrolment in the five-year period, 1906-10, was fifty-seven students. The average for the period 1926-28 was 1,808. The first graduating class, that of 1907, numbered four persons, all men. In the year 1930 the University of Minnesota conferred 516 degrees on students graduating from the College of Education. The average annual budget for the first five-year period was \$8,781, and for the five-year period from 1925-29, \$201,234. For the first five-year period the average number of instructors was 21, and for the last five-year period, 97.

Dr. Noll's paper deals with other measures of growth, all tending to establish the fact of increased interest in the study of education and in the training of teachers.

PROBLEMS OF STUDENT GUIDANCE

With the increase in undergraduate enrolment, the differentiation of educational positions in the public schools and in colleges, and the specialization of curricula, the problems of student guidance have increased greatly in recent years. To meet this situation, during the past biennium the College of Education has developed an elaborate and comprehensive system of student guidance and counseling. This program has followed two main lines: first, that of studies dealing with the selection and training of students for educational positions, and second, the practical techniques for guiding individual students toward the field of their greatest probable efficiency.

STUDIES IN GUIDANCE

Through a period of years the students of the College of Education have taken general examinations both at the time of entrance to the freshman class and again at the beginning of the junior year. The major portion of the students in the College of Education enter after two years of junior college work at Minnesota or elsewhere. The junior tests, therefore, constitute the entrance examinations for this body of students. For each student a cumulative personnel record is begun at the time of the student's entrance and this record is continued until graduation.

For a period of years the data on these personnel records has accumulated, and during the past two years special effort has been made to analyze the results of these examinations in terms of criteria of student and teaching success. In the fall of 1928 Dr. Willard Olson made an analysis of a portion of this data and prepared a report at the close of the year. Dr. Olson's study was repeated and extended by Dr. Victor Noll during the year 1929-30. The study deals with such matters as the education and occupation of parents, sources from which students are drawn to the College of Education, high schools attended, sex, age, intelligence, and scholastic record.

The second section of the report deals with the probable factors operating in elimination, survival, and graduation from the College of Education. In this section is treated the matter of scholarship in relation to the major field of specialization, to junior college attendance, to education of parents, and to activities of the Students' Work Committee.

The third section deals with the factors operating in the placement of graduates of the College of Education, covering fourteen different items.

The final section of this report, comprising approximately fifty typewritten pages, gives implications of the study for the guidance of college students. These fifty pages constitute not merely a highly important record of the results of our tests over a period of years, but they contain definite suggestions as to the importance of such factors as intelligence scores, paternal occupation, scholastic record of students, high school likes and dislikes in reference to the successful completion of the course of study, and to placement in positions.

During the biennium, also, Dr. Homer Smith made a study of teaching as a vocation. This was a preliminary study dealing with a wide range of factors operative in determining the desirability of education as a life work for young people, its probable economic return, its possibilities of success, its relation to various measures of ability, etc.

A faculty committee consisting of Dr. Dora V. Smith, Mr. Philip Rulon, Mr. Randolph Smith, and Dr. Helen D. Bragdon, chairman, studied the problems of individual students, and developed a program for meeting them. The problems studied covered not merely those found to be common to college students, but also those peculiar to students in the College of Education. In particular, an examination was made of the student problems brought to counselors. These investigations, which are filed in this office in several different reports, resulted in a statement of the principles and techniques of interviewing, special aids of counseling, methods of recording interviews, and plans for advising and remedial activities.

GUIDANCE MONOGRAPH

To facilitate the use of available data in reference to student counseling in the College of Education, a special monograph was prepared in the summer of 1929 and distributed to all advisers of students in the College of Education at the beginning of the year 1929-30. This booklet covered the results of the various investigations outlined above and an analysis of

the state laws regarding certification of teachers, the technique and procedure of registration, graduation requirements, specialized curricula, and graduate work in the field of education. This initial monograph has been of considerable use during the current year. Some portions of it are now in the process of revision in the light of new data and will be re-issued to student advisers in the near future.

ADVISERS AND COUNSELORS

How large a program of advising and counseling is now in operation for students in the College of Education may be suggested by the fact that there have been, during the year 1929-30, fifty members of the faculty available in special fields for advising regarding matters of curriculum. Each of these persons is, in his own field, specially informed concerning curricular requirements. In addition to curriculum advisers there have been a number of special counselors, including the dean of the College of Education, the members of the Students' Work Committee, and several other members of the faculty. In some cases, instructors have been relieved of a part of their instructional load to give time to the special needs of individual students. Conspicuous in this latter group have been Dr. Helen D. Bragdon, assistant professor of educational psychology; Dr. Dora V. Smith, assistant professor of education; Miss Jean Alexander, instructor in education, and Dr. W. E. Peik, assistant professor in education.

RESEARCH AND PUBLICATION

During the biennium the college has continued to carry forward educational investigations and to publish results. Such work has engaged both the members of the teaching staff and the graduate student group. In the office of the dean of the college is kept a file of all faculty publications including books, monographs, and journal articles. This file grows rapidly and constitutes *in toto* a highly important addition to available knowledge about education. During the past biennium conspicuous contributions have been made by Professor Engelhardt, Professor Brueckner, and Professor Peik in the matter of books, and a much larger number of staff members have published in educational journals.

Particular attention may be called to the growing series of studies in the field of college education. During the biennium the following titles have appeared from the University Press:

Class Size at the College Level, by Earl Hudelson.

Problems of Science Teaching at the College Level, by A. W. Hurd.

Curricular Problems in Science at the College Level, by P. O. Johnson.

Laboratory Instruction in the Field of Chemistry, by Victor H. Noll.

Extra-Curricular Activities at the University of Minnesota, by F. Stuart Chapin.

The Professional Education of High School Teachers, by W. E. Peik.

Students' Marks in University Courses, by John E. Bohan.

Student Self-Support at the College Level, by J. G. Umstadd and Fred Hovde.

UNIVERSITY HIGH SCHOOL

By authorization of the Board of Regents, the University High School was extended in the fall of 1928 to include the seventh and eighth grades and was reorganized into junior-senior high school units. This change necessitated some enlargement of the faculty, the addition of new equipment, and the remodeling of certain rooms in the present high school building and others in the Old Law Building. During the biennium, with the addition of the new units, the enrolment of the high school has now reached approximately four hundred students, and has a faculty of thirty-four persons. Dr. Charles Boardman, principal of the University High School, filed in the office of the dean, for 1928-29, an 83-page report covering the activities of the high school unit. A similar report is in preparation for the year 1929-30.

These reports show not merely an expansion in numbers and in the new grades included, but considerable reorganization of curricula providing for new offerings in music, art, industrial arts, and other subjects. There has also been inaugurated during this biennium an educational guidance unit in connection with the high school. This unit, organized under the principal of the high school, is planned, first of all, for service to students in the University High School, and second, as an administrative and training unit for college students preparing for the work of educational guidance in the public schools. While this unit of work is only in its early stages, it has already demonstrated its high usefulness to individuals and departments in the high school, in the better allocation of pupil interests and activities, to the college itself in the way of training college students for guidance work, and finally, in the promotion of important phases of educational research.

Even with the expansion, the high school is still inadequate to provide in full the needed facilities for student teaching. Under the agreement with the Minneapolis and St. Paul public schools, therefore, we continue to use the schools of the Twin Cities for this purpose.

DEMONSTRATION SCHOOL

During the year a new agreement has been negotiated with the Minneapolis school system, a copy of which follows herewith.

This instrument witnesseth an agreement entered into by the Board of Education of the City of Minneapolis and the Board of Regents of the University of Minnesota and providing for certain co-operative educational procedures of mutual interest to the University and the Public Schools.

The said agreement covers the following matters and methods of procedure:

A. Administrative control

The executive administration of this agreement shall lie with the superintendent of the Minneapolis Public Schools and the Dean of the College of Education or such persons as may be designated by them or either of them as their representatives. In the case of delegation of executive power or responsibility to other than the individuals named above, the information of that fact shall be made a matter of written record and transmitted to all whose work is affected thereby.

B. Informal observation of educational work

Informal observation designates the practice of observing teaching and other educational activities as these are normally carried out in the schools. It excludes all work connected with practice teaching, demonstration teaching, and experimentation.

Informal observation in the Minneapolis Public Schools by students and others connected with the University will be governed by the following rules of practice:

1. Field available

Facilities for informal observation are available in the following fields:

- Instruction in art and industrial arts
- Activities in the six-grade elementary schools
- Activities in the secondary schools
- Activities in the senior high school library
- Teaching of home economics
- Teaching in kindergarten and nursery schools
- Teaching of music
- Teaching of physical education (boys)
- Teaching of physical education (girls)
- Teaching of special class pupils
- Teaching of commercial subjects
- Administration and supervision of instruction in any of the fields above mentioned.

2. Procedure

- a. It will be expected that college students will visit classes in the public schools as a part of their college work only upon the definite assignment by their instructors and approval of the Superintendent of Schools.

C. Student teaching

It is understood that the term student teaching shall refer to the teaching and related activity of students registered in the College of Education or pursuing work in education as graduate students. Students may undertake such work in the public schools only upon definite assignment in the manner to be described later.

1. Fields of work

The fields of work in which practice teaching may be undertaken shall be as follows:

- Instruction in art and industrial arts
- Activities in the six-grade elementary school
- Activities in the secondary schools
- Activities in the senior high school library
- Teaching of home economics
- Teaching in kindergarten and nursery schools
- Teaching of music
- Teaching of physical education (boys)
- Teaching of physical education (girls)
- Teaching of special class pupils
- Teaching of commercial subjects
- Administration and supervision of instruction in any of the fields above mentioned

2. Procedure

The Board of Education will accept approved students of the College of Education and shall definitely assign them to practice teaching and related activities which will facilitate their training. It shall be understood that during their period of assignment, such students shall be definitely under the control and direction of the professional staff on the public schools.

3. Salary

The Board of Regents agrees to pay a stipend, the amount to be determined in the individual case of each appointee, to certain selected instructors in the public schools who shall assume responsibility for the proper guidance and training of the university students while they are so assigned. This stipend shall be in addition to the salaries which such teachers already receive from the Board of Education.

D. Demonstration teaching

Demonstration teaching is understood to mean an exercise by a teacher and class for the purpose of setting forth by example a designated method of classroom procedure. Such teaching is conducted for observation by a group.

1. Fields of work

Demonstration teaching may be conducted in any of the fields of work given under the designated list for student teaching.

Persons appointed for demonstration work shall be called demonstration teachers or demonstration principals.

E. Demonstration school

When facilities for demonstration teaching are available in a single school for a number of classes or for several varieties of school work, such a school may, by agreement, be designated a demonstration school for University students. The desirable conditions for the creation of a demonstration school shall be as follows:

1. Suitable location
2. Adequate building facilities
3. Sufficient enrolment
4. Qualified staff

The principal of a demonstration school will be a person of satisfactory experience who also possesses the training which qualifies him to manage and direct the work of a demonstration school. He will be informed concerning the standard educational procedures in the field in which his school is intended to function and familiar with recent progress in that field. Since he will be responsible for the administrative direction of demonstration teaching, his qualifications will be more extensive than those generally required of a principal, and he will be able to discuss demonstration procedures with those who observe them.

The staff of the demonstration school will likewise be persons particularly qualified by training and experience for demonstration teaching.

F. University teaching

When supervising teachers or demonstration teachers or principals are qualified for University teaching they may be appointed for such service as a part of the total service they render to the public schools and to the University.

G. Method of appointment

Any instructor or other school officer appointed to a position under this agreement shall be so appointed by the joint action of the Board of Education and the Board of Regents.

H. Salary

The salary of any instructor or other school officer appointed under this agreement shall be fixed in reference to his qualifications by the joint action of the Board of Education and the Board of Regents.

I. Effect of agreement

At the time that this agreement becomes effective, all previous agreements between the Board of Regents of the University of Minnesota and the Board of Education of the City of Minneapolis relative to co-operative activities shall be abrogated.

This agreement shall be in effect from the date of the signing of this contract.

University of Minnesota

(Signed)..... 1930
Comptroller

(Signed)..... 1930
Superintendent of Schools

Minneapolis, Minnesota

The immediate purpose of this new agreement has been to provide an elementary demonstration school for the use of our students and faculty. The Tuttle School, located near the University of Minnesota campus, has been designated as the demonstration school for university students beginning in the autumn of 1930. Mr. Harry Cooper, assistant to the

superintendent of schools, and formerly a superintendent of schools in South Dakota, a principal of an elementary school in Minneapolis, and an instructor on the College of Education staff, has been designated as the principal of the demonstration school. The peculiar function of this school will be to develop a high grade of elementary education and to provide opportunity for advanced students in the College of Education to observe the excellent work which will be provided. The school is not intended to be an experimental unit nor to give opportunity for student teaching. This is, we believe, an unusual development in the relation of public schools to colleges of education and one which is fraught with very important possibilities for the future training of teachers at the University of Minnesota.

BUREAU OF RECOMMENDATIONS

The Bureau of Recommendations has continued to function in behalf of qualified teachers during the biennium. With the increasing numbers of students graduated, not merely from the University of Minnesota but from all colleges educating teachers, the placement of the young graduates has become peculiarly difficult. Vacancies are not as numerous as formerly, and there is a larger number of experienced teachers available for recommendation.

The following table gives essential data for the two years:

REGISTRATIONS AND PLACEMENTS

Bureau of Recommendations

1928-29 and 1929-30

Year	Number registered			Total
	Paid Registrations	Re-registered (for 2 years)	Faculty No Fee	
July, 1928 to July, 1929	915	86	13	1,014
July, 1929 to July, 1930	950	47	16	1,013

RECEIPTS

July, 1928 to July, 1929—915 paid registrations @ \$3.00.....			\$2,745
July, 1929 to July, 1930—950 paid registrations			
54 @ \$3.00.....	\$ 162		
896 @ 4.00.....	3,584		3,746
47 re-registrations @ \$1.00			47
			\$3,793

CANDIDATES PLACED AND REMOVED

	Placed	Removed
July, 1928 to July, 1929.....	591	52
July, 1929 to July, 1930.....	620	55

Only those persons are served by the Bureau of Recommendations who make formal registration. The registration fee for the bureau, which was formerly \$3, was raised during the biennium to \$4 per individual. During the biennium the University of Minnesota has received from such fees ap-

proximately \$6,538; 2,227 persons were registered, and approximately 1,318 found positions.

Those who are not successful in being placed in positions the first year after receiving their B.S. degrees are carried on the active file the ensuing year without charge. One hundred twenty-five registrants were given service during the last two years for this reason. With the increase of the registration fee to \$4 this past year, an additional \$1 was required of forty-seven candidates.

Faculty and graduate assistants in the College of Education have been allowed to register without payment of the regular fee. During the biennium twenty-nine such candidates received free service from the bureau.

FEDERAL INVESTIGATION OF TEACHER PREPARATION

The College of Education as well as certain other units of the University of Minnesota is interested in the recently authorized investigation of the problems of educating teachers. During its past session the Federal Congress authorized the Office of Education to conduct such an investigation and provided funds not to exceed \$200,000 for the expenses thereof. The first \$50,000 of this sum will be available for the year beginning July 1, 1930. It is supposed that the investigation will be completed during the period of three years. The dean of the College of Education has been invited to act as a consultant in this investigation. He will be one of a group of eleven persons who, in the words of Mr. W. F. Cooper, United States Commissioner of Education, "will act as a board of directors for the investigation."

Attention may be called to a study of like nature in the state of North Dakota which has been carried forward during the past year by Professor W. E. Peik of the College of Education staff. Professor Peik was invited by the office of the Superintendent of Public Instruction of the State of North Dakota to study the situation in regard to the education of teachers in the state of North Dakota. He spent some time on the ground collecting data, conducting interviews and conferences, and as a result of his study he formulated a report and made certain recommendations for the improvement of conditions in the state of North Dakota. This report has been mimeographed for distribution. It has not merely excited great interest and much favorable comment and some favorable action in the state of North Dakota, but has attracted the interest of those interested in the problem of teacher training throughout America.

Attention may also be called to the survey of Gustavus Adolphus College and Minnesota College conducted by Professor Fred Engelhardt and his assistants at the invitation of the Minnesota Conference of the Swedish Lutheran Church. This investigation has been completed and the report made to the conference. An abbreviated form was published, and as a result of this investigation the conference took important action relative to their future policy concerning the institutions studied.

During the biennium the dean of the College of Education has continued his active interests in behalf of the better education of college facul-

ties, working with a committee of the North Central Association of Colleges and Secondary Schools. A final report prepared by him and presented at the last meeting of the North Central Association in March, 1930, is appended hereto. As a result of the activities of this committee and of certain other committees of the North Central Association a somewhat extended program of study and investigation has been authorized by the Commission on Higher Institutions of the North Central Association.

Respectfully submitted,

M. E. HAGGERTY, *Dean*

REPORT OF THE COMMITTEE ON PROFESSIONAL TRAINING OF COLLEGE TEACHERS, 1930¹

To the Commission on Higher Institutions:

GENTLEMEN: The most important matter to be reported by your Committee on Professional Training for the year 1929-30 is the increasing good-will which now supports the work of this Committee. The sharp conflict of divergent attitudes, which, at times, amounted to hostility, under which the Committee began its work five years ago, if it has not entirely disappeared, has, at least, assumed a silent rôle during the current year. Because of this changing sentiment we are now able to work upon the problems of recruiting better faculties and the improvement of college instruction with the assurance of mutual confidence shared by all who are parties to our deliberations.

The most recent meeting of our committee, at which Dean Effinger, Superintendent Gosling, and Dean Haggerty of the committee were present, was also attended by President Rainey and Dean Nollen representing the liberal arts colleges, and by Dean Laing and Dean Payne representing graduate schools. Dean Seashore, who had been invited, was represented by Dean Packer. At this meeting the problem of improving faculty standards was faced frankly by all present, without rancor or any of the defensive attitudes born of prejudice and suspicion. There was complete understanding and agreement that in the matter of securing better faculties higher education confronts a major problem upon the proper solution of which will hinge its future effectiveness. No cavalier opinions were delivered, no panaceas for college ills were offered, no person and no group working upon the problem were denounced. Quite on the contrary there was the utmost desire to analyze problems, to seek common counsel, to pool all resources in the direction of providing our colleges with better faculties and with the needed measures for faculty improvement.

Your committee submits this meeting with all the activities that have led up to it as an evidence of genuine progress. As not before, we are now in a position to go forward.

In the circumstances under which this committee operates in the North Central Association there are four groups of persons or institutions that have a direct interest in its purpose of devising improved standards for college faculties. These groups are the public schools, the colleges themselves, the graduate schools which educate college faculties, and those who study and teach education in colleges and universities. It will require the pooled wisdom of all these agencies to do for colleges what their immediate necessities require.

The interest of the public schools is two-fold. From the colleges flows the ceaseless stream of young men and women who replace the fast depleting ranks of teachers in the public schools. It is not too much to ask

¹ Presented to the commission on March 19.

that these young people shall have been well taught during their college days, because that which has been done to, for, and with them will determine to a large degree what they will do to, for, and with the children whom they, themselves, essay to teach. Furthermore, the public schools maintain a continuing interest in the boys and girls who go on to college. Devoted high school teachers would be devoid of the best qualities of faithful teachers if they could forget the welfare of their high school graduates. Rightfully they do not forget and they legitimately ask that college teaching shall be on the highest level possible.

If the public schools have been critical of the college treatment of freshmen, it is because the high schools have come to feel, rightly or wrongly, that colleges are frequently less interested in giving superior instruction to the students who come to them than they have been in selecting the gifted students who can educate themselves with even poor teaching. The least the college can do is to remove any ground for this suspicion of indifference. Let it become apparent that the colleges are alert to the matter of improving the management and teaching of college freshmen and the high schools will give approval to the college program. They do not desire to prescribe ways and means but they wish to be assured that the widening effort to improve educational procedures in the high school shall not be stopped at the threshold of the college. More than this they may not claim; this much the colleges should hasten to assure them is forthcoming.

The obligations of the graduate schools are clear. With more than half of their doctorate degree recipients finding their life work in college teaching they have the inescapable task of preparing their students for teaching activities. Few of these schools have yet faced this issue squarely, being more concerned with producing scholars than with educating teachers. The attitude of these schools is altering and in a number of them radical changes in the requirements for the doctorate have already been made. In others faculty committees are at work to produce new programs.

It may not be expected that the education of college teachers can be greatly improved by sudden action. The problems are too numerous, intricate, and difficult. What we may legitimately ask of the graduate schools at this time is that they shall recognize the problem and set in motion the machinery for its solution.

Those who study and teach education in colleges have a direct and selfish interest in the improvement of college faculties. As college teachers they are colleagues of those who teach English and science, and they would like to find in their academic mates a little more understanding of the place of educational subjects in the college curriculum, a little more hospitality toward themselves as members of the academic community. They believe that the ancient antagonism to pedagogy which has been carried over to all the new interests and activities which they represent is, to use Dean Laing's phrase, "an archeological prejudice" that will disappear when their critics themselves learn something about education. In behalf of the interests they represent, they would, therefore, hasten the day when college faculties will be systematically informed about education.

The educationists further feel that they can contribute something to the improvement of college education. To them the problems of the college are not wholly unlike those of the elementary and secondary schools where the usefulness of educational science is now widely recognized. In a genuine spirit of helpfulness they desire to make available to other college teachers and administrators all the information they possess about curricula, about instruction, about student management, about college organization and administration. Most of all, the teachers of education wish to join their academic colleagues in the study of college problems. In their best moments, they are willing to doff their professional prepossessions and face every issue as an unsolved problem, pooling all their skills and knowledge along with the competences of their academic friends in a

program of educational inquiry to the end that the whole level of college education may be elevated.

The part of wisdom for the colleges is to welcome the genuine interest of all these groups in the difficult tasks the colleges confront, and to institute means by which the energies of all may be made effective for the common purpose of improving college education. The Commission on Higher Institutions would seem strategically designed to accomplish the integration of all these forces, and if this can be brought to pass, this commission will have rendered a unique service to the whole cause of higher education.

Viewing its task in this large way your Committee on Professional Training has felt its assignment to be too restricted for the most intelligent work. If by "professional training" one implies merely that an individual has, in college, studied certain courses called education, it should be clear without argument that this can be but a partial conception of a college teacher's education. We should prefer to think of professional training as inclusive of all the activities involved directly in the preparation of an individual for college teaching and administration. Since we have not been clear that our assignment may be so interpreted, we have made progress slowly during the current year and we come back to you asking that our mission be more broadly defined as the enlistment, preparation, and improvement of college faculties. This is our major recommendation.

The committee has, however, done one bit of work. President Zook, as secretary of the commission, sent to each college in the Association a request that it furnish a sample of the record form used for faculty members. Two hundred sixty-five colleges responded and one hundred fifty-nine personnel or application blanks were received. One hundred six colleges said that no such blanks were in use. Only a few of those received could be regarded as in any sense a permanent cumulative record.

The numerous items on these blanks have been tabulated under four categories of personal information, educational preparation, experience, and evidences of scholarship—approximately a hundred separate items. In only one item did the blanks agree; each provided a place for the name.

Details of this tabulation would not be illuminating, but on the basis of this study we have constructed a provisional Faculty Record Form and present it herewith for your consideration.¹ It contains the items most frequently found in the blanks received, and also the items called for in the Triennial Report of this commission. It is so arranged that it may be used at the time of first appointment and as a cumulative record for subsequent years. It is proposed to revise this tentative form for more permanent printing. The adoption by a college of some such record form as this would seem to be a first step in an intelligent approach to the problem of better faculties. If all the colleges accredited by this commission would adopt such a record, it would render much easier the collection of data in the Triennial Report.

Which of the items in this record will prove most useful for standardizing purposes we would not now undertake to say. It is doubtful if any one of them should be singled out for this purpose. A usable standard of faculty competence will probably involve some integration of several, if not all, of these items and possibly others not here given into a composite criterion. The procedure to be followed in this matter is that of investigation. Few of us will doubt that the quality of a college faculty is a basic element in the worth of a college, but how to measure this quality and express it in the simple terms necessary to the definition of a usable standard are matters about which we need vastly more information than we now possess. Your committee, therefore, believes that the part

¹ Copies of this form can be secured by writing the Secretary, J. B. Edmonson, Ann Arbor, Michigan. They will be ready for distribution before the college year opens in the fall. One copy will be sent gratis to each institution applying. A small charge will, however, be made for quantities.—The Editor.

of wisdom for this commission is to support a program of research designed to provide this needed knowledge.

Colleges, however, need something more than minimal standards for accrediting. They need ideals of excellence and the techniques of self-improvement by which, year by year, they may upgrade the faculties they have once appointed. In its 1927 report your committee reviewed the efforts then reported by colleges through which they sought to improve college instruction. The report said, "When it comes to the formal means of improvement such as systematic supervision, demonstration teaching, visitation of classes, course instruction in education, or experimental teaching, the provision is so occasional as to appear negligible." and further "Among college administrators there is at present little sympathy with the professional training of college instructors either before or after their employment."

Concerning such matters there are abundant reasons to believe that attitudes and activities have markedly changed since that report was printed. With your permission the committee would be pleased to canvass the situation again, particularly with a view to bringing before the commission a year hence certain conspicuously successful efforts to improve instruction and to stimulate faculty growth. There is ample reason to believe that certain colleges have carried through activities that might well be given wider publicity than they have yet received.

Among all the circumstances which impinge upon the work of this committee nothing is more heartening than the growing willingness of graduate schools to join with other agencies in providing improved training for prospective college teachers. After our initial inquiry to deans of graduate schools we were compelled to write in our 1927 report that "Indifference to the need of such training is all but universal in the graduate schools." Such a statement would be incorrect if made today. The replies from deans of graduate schools received by Dr. Kelly in response to the communication from the Association of American Colleges reveals an appreciation of the problem that did not exist five years ago. While these replies still betoken a copious unwillingness to face the situation fully, they also reveal a genuine concern in many institutions to make the training of graduate students more helpful as a preparation of college teaching. In a number of places new efforts to improve the situation are actively under way.

Furthermore, the Association of American Universities at its annual meeting in November created a committee of its own members to study the problem. Dean Payne of Indiana University, the chairman of this committee, is gathering information upon the problem and will report a year hence. He sat with our committee at its recent meeting, a first step, may we hope, of a continuing program of co-operation.

Examples of what is occurring among graduate faculties could be drawn from a number of institutions, but recent events at the University of Chicago may be cited in illustration. Here we have first of all a clear cut recognition by the President of the University that a problem exists and that a clear obligation to find the means for its solution rests upon the university. We have also informal and formal conferences which bring together the administrative heads of the colleges and the graduate school, the academic faculties and the faculty in education. Out of such conferences come certain definite proposals for new activities. The proposals now under consideration as reported to us by Dean Laing contemplate three university courses each the equivalent of a major. One course will be concerned with the techniques of teaching a subject to be given by a departmental professor especially interested and competent in matters of teaching. A second course will involve instruction by the graduate student of college classes supervised by a departmental officer. The third major will be concerned with the college curriculum and will be given by a professor of education. The courses will be elective and there will be no relaxation of the requirement in research. The three majors will be a part

of the total training for the doctorate and the candidate will, in addition to the degree, receive a certificate as a college teacher.

We do not understand that this program has been adopted, and it may be much modified through further discussion. Nor would we assume to pass judgment upon its probable usefulness. It may be noted that this program does not meet completely the recommendations of our committee a year ago.¹ We would, however, submit that such a program is worthy of the attention of all of us who are concerned with the problems of college improvement, and we would hail the Chicago development as a thing unique in American higher education except for the fact that like activities are developing in a dozen other places.

For one further illustration we shall cite a recent action of the graduate faculty at the University of Iowa. An excerpt from the faculty minutes reads as follows:

"It was moved and seconded that the various departments carrying students to the doctorate be encouraged to make provision for, and maintain a training course in, the art of teaching within the field of the major subject, and that the department of education be asked to establish a two-hour survey course for one semester for the benefit of candidates for the doctorate who are planning to teach. Motion carried.

"It was agreed that the survey course should be conducted as a seminar during the first semester and that it would be advantageous for each department to follow this in the second semester with the departmental training."

May we repeat that no more hopeful event has occurred within the life of this committee than this obviously growing interest on the part of graduate faculties in better training for college teachers.

In summary your committee asks these things:

First, it seeks a re-definition of its function so as to cover the whole problem of enlistment, preparation, and improvement of college faculties. To comport with this broader concept it suggests that its name be changed to Committee on College Faculties.

Second, it asks that you recommend to colleges the adoption of a faculty record form adequate in scope and designed to provide a cumulative record for each member of the faculty.

Third, it asks your approval for conducting a survey to discover the character of efforts now being made in colleges to improve instruction and to promote the professional growth of faculty members.

Fourth, it seeks your commendation for the efforts made to bring together the representatives of all the agencies concerned with the problems it has faced. It believes these initial essays at co-operation are fundamental and desires to know that you approve their further extension.

Respectfully submitted,

(Signed) J. R. Effinger
T. W. Gosling
J. M. Wood
M. E. Haggerty
W. E. Smyser, Chairman.

EDITORIAL NOTE: After considerable discussion respecting the above report the Commission took the following action, as recorded in the minutes of the meeting:

Voted that the report of the Committee on Professional Training be received, the Committee continued, and the recommendations contained in the report adopted.

Voted that the Committee on College Faculties be authorized to attend the meeting of the Deans of Graduate Schools in 1930 in connection with the annual meeting of the Association of American Universities.

¹ Report of the Committee on the Professional Qualifications of College Teachers, *North Central Quarterly*, September, 1929, p. 12.

THE GRADUATE SCHOOL

To the President of the University:

SIR: I am submitting herewith the report of the Graduate School for the years 1928-29 and 1929-30.

The total of 2,164 graduate students registered during 1928-29 and 2,225 in 1929-30 is significant of more things than mere growth over preceding years. This growth at the University of Minnesota will probably be reflected also in the reports of every other leading graduate school. It becomes, then, significant of a national tendency to prolong the period of preparation for teaching and research and of the response by universities and students to the demand for more adequate training for the varied tasks of modern society. It means that competition is becoming keener for all positions for which education is a major qualification. For some of this group of positions and professions the Master's degree is replacing, or will soon replace, the Bachelor's degree; and for others, the Doctor's degree, as a requirement, is only a matter of a few years. The small colleges are already rather indiscriminately seeking men with the Doctor's degree or bringing pressure to bear on their middle-aged, underpaid, and overworked professorial ranks to use summers or a year's leave to get the degree. May I say in passing that the value of such degrees, if attained, is rarely a sufficient return to the man or the college for all the sacrifice and labor? One of the most distressing matriculants in the graduate school is this type of degree seeker. If the degree were not made a fetich by him or his president, he would be free to enrich and widen his knowledge and go back to his college a more valuable and inspiring teacher. Under present conditions he frequently fails of the degree and goes back discouraged and depressed, less useful in vital matters, and sometimes with his position endangered by the failure of a futile attempt to do what he should never have attempted.

In some connection with these reflections, and that not so remote, I should like to comment on the increasing discussion, one might almost say agitation, about the teaching qualifications of the holders of advanced degrees. The Association of American Colleges and certain sectional organizations of colleges and secondary schools have had committees discussing it and sending out circular letters and questionnaires, and have even passed resolutions before, it seems to me, they had the facts before them. I have made a survey of the teaching experience of those who took the Master's degree both in arts and science, and the Doctor's degree, at the University of Minnesota in the one year, 1927-28. The data are drawn from the blank filled out when the successful candidate first matriculated. It is confessedly inadequate from two standpoints. The candidates usually, it is evident, put in only the teaching years after they attained a high school position and frequently begin it with their first principalship or superin-

tendency, or if it is college work, after they had passed their apprenticeship as teaching assistant. Further, as the statement is made when they first matriculate and their work for the degree, especially the doctorate, is frequently if not usually interrupted by other years of teaching, the data do not cover all I was seeking to find. What follows, therefore, errs in being far too conservative.

Taking all the 183 masters, including those who went into the fields of medicine, agriculture, chemical research, business, social work, journalism, etc., as well as teaching, the records show an average of two and one-half years of teaching. The 117 who went into teaching with a Master's degree from the University of Minnesota had an average of three and one-half years of teaching experience. The range was from 0 to 23 years of service in the classroom.

Taking the doctoral candidates about whom there has been the most discussion and including the whole 55 irrespective of the career into which they went, the average is five years' teaching when they first registered as graduate students. Only one had no experience, and she chose marriage in preference to museum work. Taking the 32 who became teachers, as shown by alumni records, the average is seven years. This excludes one who is a college administrator with twenty-two years' experience as a teacher. If these people are failing as teachers in the places they now hold, then more experience would make them worse and not better. Indeed, it would be rather easy to argue on the same a priori grounds that critics have taken that some who go to graduate schools have been made less efficient as students and prospective kindlers of intellectual enthusiasm by the experience or the kind of teaching experience they have had and sometimes by the sheer amount of it.

The upshot of all these data for one middle-western university graduate school is what by common sense might be expected and what is undoubtedly true of every other graduate school in the area and probably beyond it. America has not yet produced a leisure class who choose college teaching and research. Those who go into such careers earn their own way often over too long a time and sometimes with painful and devitalizing struggles. Teaching is the profession they choose to earn the money to pay for more education to do more teaching on higher levels.

Some explanation other than lack of experience must be sought to explain the maladjustment of doctors of philosophy to small college conditions. And maladjustment is a different word than failure and implies other factors than the holder of the doctor of philosophy degree himself.

If the ground is shifted to the want of formal courses in education, the books will, I think, have something to say in reply to that allegation.

The plain fact is that education on the college level has had such a startling growth in recent years that there are not enough good teachers with requisite skill, scholarship, and character to man the overflowing classrooms. We know that simple fact at Minnesota with fifteen thousand students, and are struggling to meet it. A score of other great universities

are confronted with the same difficulties in recruiting their staffs. It is not to be supposed that the difficulty will not extend to every institution striving to do sound college work. There are no 100 per cent efficient teaching staffs, big or little. For the comfort of those whose complaints I have been considering, it may be pointed out that the chances of a high percentage of worth while teachers is as good or better in a staff of twenty or thirty as they are in an institution that requires six hundred to a thousand best teachers. And if one disregards the institutions whose resources and equipment do not entitle them to give a Bachelor's degree, the product of the real college deserving the name is still every bit as good, judged by their work in graduate schools, as those of much larger institutions. And these graduates are really the product of only one or two professors on the staffs of the institution from which they come.

A registration of over 2,200 graduate students who practically all announce themselves as prospective candidates for a degree (25 per cent say the doctorate, a figure or intention or pious wish that is not to be taken too seriously) creates university problems that I have discussed with you. The teaching of this mass of students on the graduate level is a growing burden on the staff already with schedules often not arranged with reference to the services they are performing as members of college staffs. The giving of the written and oral examinations including the preliminary and final examinations for candidates for the Doctor's degree, the reading of the theses required of all Master's and Doctor's candidates is at times a full time task for those of the staff who act as advisers or instructors for considerable numbers of graduate students. Much of this labor comes naturally at the time when college duties are also heavy. At other times it forces us to put graduate students into classes for senior college students. Often there is an educational justification for this and no loss to the graduate students. Too often, however, it means that for a disproportionate part of his time the graduate student is still being treated as an undergraduate. That is not defensible if we are to do real graduate work. By some readjustment of organization, graduate teacher and graduate student should be freed to do the work which is of major interest to both.

As a conclusion I append in much abbreviated form a statistical summary omitting a number of long tabulations that have appeared in previous years. Then follows the report of the director of the Mayo Foundation.

Respectfully submitted,

GUY STANTON FORD, *Dean*

CLASSIFICATION OF GRADUATE STUDENTS ACCORDING TO DEGREES APPLIED FOR

	Year 1928-29	Year 1929-30
Master of arts	1,026	989
Master of science	612	588
Engineering degree	11	3
Master of laws.....	4	3
Doctor of philosophy.....	439	446
No degree desired.....	72	196
Totals	2,164	2,225

CLASSIFICATION OF GRADUATE STUDENTS ACCORDING TO RANK OF STAFF

	Year 1928-29	Year 1929-30
Professor .....	...	2
Associate professor	4	3
Assistant professor	19	14
Instructor	148	166
Teaching fellow	72	65
Assistant	169	195
Mayo Foundation fellow.....	357	346
Fellow .....	...	10
Totals	769	801

CLASSIFICATION OF GRADUATE STUDENTS ACCORDING TO AMOUNT OF WORK REGISTERED FOR

	1928-29	1929-30
Men registered full time	307	285
Women registered full time.....	116	149
Men registered part time	358	431
Women registered part time	255	224
Men registered full time Mayo Foundation.....	345	318
Women registered full time Mayo Foundation...	12	22
	1,393	1,429
<i>Summer Quarter</i>		
	1928	1929
Men registered full time	272	282
Women registered full time.....	150	154
Men registered part time	186	168
Women registered part time	163	192
	771	796
Totals	2,164	2,225
Total men registered, 1928-29.....	1,433	
Total women registered, 1928-29..	731	
	2,164	
Total men registered, 1929-30.....	1,484	
Total women registered, 1929-30..	741	
	2,225	

FOREIGN STUDENTS REGISTERED IN GRADUATE SCHOOL

	1928-29	1929-30
Armenia	1	..
Austria .....	..	1
Australia	2	1
Canada	49	32
China	8	6
Denmark	2	1
England .....	..	2
France .....	..	1
Germany	5	5
Ireland	1	..
Italy	3	3
Japan	1	1
Korea	1	..
Mexico	1	..
New Zealand	2	2
Norway	1	2
Palestine .....	..	2
Philippine Islands	6	7
Porto Rico	1	..
Russia	1	3
Scotland .....	..	1
Slovakia .....	..	1
South America	1	..
South Africa	1	1
Spain .....	..	1
Sweden .....	..	1
Switzerland	1	1
Turkey	1	1
Wales	1	..
	90	76

SEVENTH REPORT OF THE
DIRECTOR OF THE MAYO FOUNDATION FOR MEDICAL
EDUCATION AND RESEARCH

Herewith is presented a brief summary of the finances and work in medical education and research of the Mayo Foundation from July 1, 1928 to June 30, 1930:

FINANCIAL STATEMENT

On July 1, 1929, the balance in the foundation fund was \$6,215.77. During the year there has been added \$168,468.24 gross income from the fund which includes sales of securities. The total expenses for the year, including investment costs, were \$647,344.51 of which \$173,052.30 was paid from the foundation fund and \$474,292.21 from the educational fund of the Mayo Clinic. The balance in the foundation fund on June 30, 1930, was \$1,631.71. The total amount budgeted from the Mayo Foundation fund for the year was \$105,925.

Faculty.—The number of members of the faculty in the Mayo Foundation is shown in the following table:

FACULTY CHANGES

	Professors	Associate Professors	Assistant Professors	Instructors	Total
Number on duty July 1, 1928...	24	26	32	58	140
Promotions .....	..	1	8	..	..
New appointments .....	..	1	..	16	18
Deceased .....	..	..	1	..	1
Resigned	2	3	2	3	11
Number on duty June 30, 1930.	22	25	36	63	146

Applications for fellowships.—During the year of 1928-29, 1,260 individuals made written inquiries or came for personal interviews concerning graduate work in the foundation; during the year 1929-30, 1,251 individuals made similar inquiries. A few of these were ineligible, others were not desirable from one standpoint or another. Some were advised to apply elsewhere and others were advised to seek further training elsewhere and apply later.

On July 1, 1928, there were on file 89 formal applications for fellowships in the various specialties. During the year of 1928-29, there were received 319 and during the year 1929-30 286 formal applications for fellowships. An analysis of these 694 formal applications is shown in the table on page 350.

Students from other organizations.—Thirty-nine persons, fellows or representatives of other foundations, governments, universities, or other institutions, were on duty for short periods in the Mayo Foundation. Four of these were doing work of a definite research character and were therefore registered in the Graduate School. The organizations and institutions from which these persons came is indicated in the following table:

United States Army	4
United States Navy	2
Philippine Government	2
Cuban Government	1
Indian Medical Service	1
Rockefeller Foundation	16
C. R. B. Foundation	7
Del Amo Foundation	2
London Hospital	1
University of Amsterdam	1
University of Berlin	1
University of Turin	1
Total	39

DISTRIBUTION OF FORMAL APPLICATIONS

Majors	On File July 1, 1928	Received	Nominated	Arrived During Period	To Arrive Later	Declined	Still Open for Appointment June 30, 1930
Medicine	12	89	40	23	17	44	17
Neurology .....	..	3	1	1	..	2	..
Pediatrics	2	16	7	5	2	8	3
Dermatology .....	..	12	7	2	5	4	1
Totals medical specialties	14	120	55	31	24	58	21
Surgery	54	311	33	24	9	269	63
Urology	9	28	7	5	2	21	9
Orthopedics .....	..	9	5	1	4	2	2
Oto-laryngology	1	21	5	2	3	11	6
Ophthalmology	2	8	3	2	1	7	..
Obstetrics .....	..	7	2	2	..	3	2
Proctology .....	..	1	..	..	..	..	1
Totals surgical specialties	66	385	55	36	19	313	83
Dental Surgery	1	29	5	4	1	2	23
Radiology .....	..	15	5	5	..	3	7
Totals	1	44	10	9	1	5	30
Chemical Engineering .....	..	1	1	1	..	..	..
Pathology	1	26	12	10	2	13	2
Physiologic Chemistry	3	7	1	1	..	5	4
Bacteriology	3	5	2	2	..	5	1
Biophysics	1	6	3	3	..	3	1
Physiology .....	..	4	1	1	..	3	..
Home Economics .....	..	1	..	..	..	..	1
Social Service .....	..	6	4	3	1	2	..
Totals fundamentals	8	56	24	21	3	31	9
Grand totals	89	605	144	97	47	407	143

An analysis of the fields in which fellows in the foundation are majoring is shown in the following tabulation:

Fields	FELLOWSHIP PERSONNEL					Here June 30, 1930
	Fellows in Foundation June 30, 1928	Fellows Who Left or Were Transferred to Other Fields During		Fellows Who Came or Were Transferred from Other Fields During		
		1928-29	1929-30	1928-29	1929-30	
Surgery	120	37	31	27	26	105
Urology	11	5	4	1	6	9
Orthopedics	6	3	..	1	1	5
Obstetrics	4	1	1	2	2	6
Oto-laryngology	10	2	2	3	3	12
Ophthalmology	4	2	2	1	3	4
Proctology	3	..	..	..	1	4
Totals	158	50	40	35	42	145
Medicine	68	33	11	20	22	66
Pediatrics	5	4	1	5	3	8
Dermatology	7	4	..	1	1	5
Neurology	4	2	1	2	2	5
Totals	84	43	13	28	28	84
Pathology	8	4	1	2	9	14
Radiology	3	2	3	6	7	11
Physics	4	5	2	2	6	5
Anesthesia .....	..	..	1	1	1	1
Physiology	1	1	2	2	2	2
Physiologic Chemistry	3	2	1	2	1	3
Biochemistry	1	..	..	..	1	2
Bacteriology	3	..	3	2	1	3
Home Economics.....	1	..	1	..	..	..
Chemical Engineering..	..	1	..	1	1	1
Dental Surgery.....	8	3	6	3	3	5
Special students.....	1	..	..	..	..	1
Totals	34	18	20	21	32	48
Grand totals.....	275	111	73	84	102	277

Graduates.—Seventy-three graduate degrees were granted to fellows of the foundation during the period covered by this report. The fields in which degrees were granted are as follows:

THE PRESIDENT'S REPORT

	Master's	Doctor's
Medicine	24	..
Dermatology	3	..
Pediatrics	1	..
Neurology	1	..
Surgery	23	4
Urology	2	..
Orthopedic Surgery	1	1
Oto-laryngology	1	..
Ophthalmology	1	..
Proctology	1	..
Pathology	5	..
Physiology	1	..
Biophysics .....	..	2
Chemical Engineering	1	..
Home Economics	1	..
Totals	66	7

The 681 publications by members of the Foundation staff and the 210 publications by holders of fellowships embody the completed research work of the period. The subjects are much too numerous and touch too diverse fields to permit of ready analysis. The papers are all republished either in whole or in part in the annual volumes, *Collected Papers of the Mayo Clinic and the Mayo Foundation*.

Respectfully submitted,

LOUIS B. WILSON, *Director*

THE SCHOOL OF BUSINESS ADMINISTRATION

To the President of the University:

SIR: This report covers the major activities of the School of Business Administration for the biennium 1928-30.

TEACHING LOAD

The rate of growth in student enrolment to which attention was called in the last report has been maintained during the past two years. Detailed registration statistics are given in the registrar's report and need not be repeated here. Attention should be called, however, to the effect of this increase upon the teaching problems of the school. The teaching load as measured by student credit hours increased from 34,498 in 1927-28 to 43,679 in 1929-30, or 26.61 per cent. As this was accompanied by the addition of only two members to the instructional staff, it is evident that there has been a marked increase in the size of individual classes. In 1927-28 the average number of student credit hours per instructor was 1,078 while in the current year it is 1,284. This is an increase of 19.1 per cent.

The facilities of the school were already taxed to the utmost in accommodating the students registered in 1927-28. The growth since then has overburdened both the physical plant and the teaching staff. It has been extremely difficult to maintain standards under these conditions. It will be impossible to admit a greater number of students until more adequate facilities have been provided. In fact, it would be desirable, from the standpoint of teaching efficiency to limit enrolment in the future below the present registration figures unless some such relief is provided.

CURRICULUM

Very few changes have been made in the curriculum during the past two years. The number of required courses has been slightly reduced and some of the elective courses have been discontinued. This is in line with the policy of simplifying the course offerings as mentioned in the last report. It is better for the student to have a small number of subjects in his field of specialization and to have these thoroly covered than to have a great number of topics treated in a cursory manner. Under the present requirements ample opportunity is afforded a student to carry subjects offered in other schools and colleges while he is completing the general and specialized courses in business.

The present program is somewhat more restricted in the specialized fields than is desirable. In order to permit a greater degree of specialization and at the same time to afford an opportunity for a broad training in allied fields it will be necessary to extend the length of the course. As soon as the budget limitations will permit, the curriculum should be extended to cover a three-year program.

CO-OPERATIVE WORK

The co-operative work has been continued and extended somewhat. Contacts have been made with several of the industrial enterprises in the Twin Cities whereby students are given training for varying lengths of time during their university course. The combined Engineering and Business course has afforded an opportunity to develop this type of work.

RESEARCH

In spite of the fact that the teaching load has increased, members of the staff have been able to carry on significant research projects. In addition to the studies conducted individually by members of the staff and graduate students, two major projects have been undertaken. One is a study of the consumer and changes in methods of distribution of consumer goods. This consists of a comprehensive analysis of the newer methods of merchandising with special reference to the chain store. It is being carried on under the guidance of a group of the faculty of the school in co-operation with members of the Departments of History, Sociology, Agricultural Economics, and Psychology.

The second is a study of the unemployment problems of Minneapolis, St. Paul, and Duluth. This was undertaken by Professor W. H. Stead in co-operation with the social agencies of the three cities. As a result of these studies it has been possible to develop an index of employment which will be of use to all agencies in the Twin Cities which are interested in stabilizing industry.

Respectfully submitted,

RUSSELL A. STEVENSON, *Dean*

THE GENERAL EXTENSION DIVISION

To the President of the University:

SIR: I take pleasure in transmitting to you herewith the report of the General Extension Division for the academic biennium, beginning July 1, 1928, and ending June 30, 1930.

This report is intended to cover the activities of the General Extension Division as a whole, and also each of its subsidiary bureaus or departments. These departments are classified as follows:

1. The Department of Extension Classes, under which are embraced all short courses.
2. The Department of Correspondence Instruction.
3. The Department of Community Service under which are included the University Lyceum, the Drama Service, the Bureau of Visual Education, and the Radio Broadcasting Service.
4. The Municipal Reference Bureau.

Since Mr. Gislason, the head of the Department of Community Service, also acts as the program manager of the University Radio Service and the University Broadcasting Station, a review of the activity of this radio service is included in the report. A report of the Fifth and Sixth Annual Music Contests, which are conducted jointly by the General Extension Division and the Minnesota Public School Music League, is furnished by Mr. Abe Pepinsky who held the position of secretary-treasurer of the league for the year 1928-29, and by Mr. Otto Zelner, who held the position of secretary-treasurer of the league for the year 1929-30.

It should be noted at once that the idea of adult education, of which university extension is a well-recognized branch, has taken firm grip on the imagination of the country. Adult education in one form or another has been accepted as a standard service by educational institutions and quasi-educational institutions of various types. There is now a department of adult education in the National Educational Association. There is also now an American Association for Adult Education and a World Association for Adult Education. With each of these two organizations, the University of Minnesota through its General Extension Division holds affiliation. It is interesting to note that Mr. R. R. Price, director of University Extension, attended the meetings of the World Association of Adult Education held at Cambridge, England, during August, 1929. University extension is, therefore, but part of a movement of which the aim is to attack the problems and technique of continuing education. In addition to conducting the educational enterprises themselves, the institutions concerned must also spend much effort in popularizing the conception of the continuance of study and mental development during the whole period of life, and must also organize the programs that will make the necessary appeal.

The General Extension Division has undertaken two major research projects in adult education during the year 1929-30. Neither of these

projects has been completed; enough has been done to indicate what their yield will be.

One research project, under the direction of Dr. Herbert Sorenson and Mr. Peder Pedersen, brings to focus the study of all the agencies in Minnesota which are engaged in any form of adult education. It is hoped this analytic study of the state's activities in adult education will define clearly the University's position in the adult education program.

The second project consists of a psychological and sociological study of extension students in the evening classes. Data have been obtained concerning the ability, ages, ambitions, interests, occupations, etc., of the evening students. Results most encouraging to adult education have been obtained. Preliminary reports of these studies were made at the Minnesota Adult Education Conference which was held in South St. Paul on May 16 and 17, 1930.

The General Extension Division of the University of Minnesota conducts both formal and informal educational enterprises. Formal education is provided through evening extension classes, taught by university instructors, in the populous centers of Minneapolis, St. Paul, and Duluth, and certain other communities on the Iron Range and elsewhere in the state; through correspondence courses for those individuals who cannot attend classes; and through unit short courses in such technical fields as those needed by physicians, dentists, merchants, scoutmasters, electricians, embalmers, and others.

The division also conducts informal educational service through the University Lyceum of popular lectures, dramatic reading, and music; through Visual Instruction by providing educational films and slides for the public schools; and through the Drama Service by the circulation of reading copies of popular plays for amateur production. Informal educational service is also rendered by the Municipal Reference Bureau which provides information to municipal officers and makes investigations and researches in the field of municipal activities.

EXTENSION CLASSES

During the biennium under review, regularly organized extension classes were conducted in Minneapolis, St. Paul, Duluth, Anoka, Chisholm, Ely, Eveleth, Hibbing, Keewatin, Rochester, Virginia, and Superior, Wisconsin. These classes were of regular university grade, each one meeting one night a week for two hours during the semester of seventeen weeks. The first semester was followed immediately by the second semester of the same length. The total number of such classes was 609 for the year 1928-29, as compared with 619 for the year before. The total number of such classes for the year 1929-30 was 602, as compared with 609 for the year before. The total number of student semester class registrations for the year 1928-29 was 11,037, a net gain of 262 over the preceding year. The total number of student semester class registrations for the year 1929-30 was 11,742, a net gain of 705 over the preceding year. The total number

of individuals registered in these classes for the year 1928-29 was 6,355, a gain of 230 over the preceding year, while the total number of individuals registered in these classes in the year 1929-30 was 6,896, a gain of 541 over the preceding year.

The student fees collected for class instruction for the year 1928-29 was \$111,276, a net gain of \$2,947 over the preceding year, while the student fees collected for class instruction for the year 1929-30 amounted to \$121,415, a net gain of \$10,139 over the preceding year.

SHORT COURSES

During the year 1928-29, 13 short courses were conducted in various subjects and during the year 1929-30, 13 short courses were conducted, the courses lasting from three days to twenty-four weeks. During the year 1928-29, 1,859 people registered in these short courses, while in the year 1929-30, 869+ people registered in these short courses. Particular attention is called to the course in sex hygiene education offered in the spring of 1930 to four groups of mothers totalling 47 registrations. Questionnaires sent out indicate these mothers to be unanimous in voicing the success of this course.

CERTIFICATES

The organization of sequential programs of study leading to certificates has been continued. A certificate of 90 credits in the junior college standing was offered for the first time during the biennium under review, and was earned by two students. During this biennium, 45-credit sequences leading to certificates in life insurance, traffic and transportation, and retail credits were offered. During the coming year, 45-credit sequences leading to certificates in advertising will be offered; also 45-credit certificates in liberal arts; a social science sequence; a language and literature sequence; and a liberal education sequence. We hope that during the next biennium we shall be able to dispense with the 45-credit certificates and replace them with 90-credit certificates in all sequences.

STUDY GROUPS

Progress has been made in the organization of reading courses for club women and other organized groups as well as for individuals who do not care to pursue organized courses of study. The University Extension Association, the National Organization of the Parent-Teachers' Association, the American Library Association, and the Federal Bureau of Education are all co-operating in furnishing guidance for these reading courses. The General Extension Division is now offering a certificate for the completion of each of these unit reading courses and during the biennium under review one person succeeded in securing one of these certificates. It is believed that there will be a steady and increasing demand for this form of educational guidance on the part of the University.

CORRESPONDENCE STUDY

The Correspondence Study Department under the leadership of Mr. A. H. Speer is making steady improvement in the content of the correspondence courses, in the methods of handling lessons when they are sent in by students, and in the organization of publicity material carefully designed with the purpose of acquainting the public with the advantages of correspondence study, and in stimulating a desire to pursue educational courses by this method.

The Correspondence Study Department has begun the process of copy-righting all correspondence study courses. Fifteen manuscripts have already been sent through the medium of the official university copyrighter.

The work of Mr. Nels Anderson, the traveling field representative, was notably productive so long as he was able to give attention to the business of interesting students in correspondence study. However, half of his time has been devoted to the interests of the Department of Community Service, and for a part of each year he has been incapacitated by illness. In spite of this, however, he has been able to produce very favorable results and we hope that during the next biennium he will be able to devote his entire time and unimpaired energies to these tasks.

In response to repeated requests for authoritative guidance for meetings of women's clubs, and groups of various kinds, the Correspondence Study Department has arranged for a number of club study programs.

These programs are evolved by professors of the University and are offered as expert guidance for women's clubs, men's and women's study groups, church missionary societies, and other bodies wishing authoritative help and valuable suggestions, for a series of meetings.

While the total number of registrations in Correspondence Study for the year 1928-29 showed an increase of only about 4 per cent over the year before, the number of lessons sent in by students shows a very notable increase. For the year 1929-30, the increase was 9 per cent over the preceding year. This indicates decidedly that more students are carrying through their courses and completing them. From the educational viewpoint, this is a very desirable outcome.

MINNESOTA STATE HIGH SCHOOL MUSIC CONTEST

The Fifth Annual High School Music Contest, conducted jointly by the General Extension Division and the Minnesota Public School Music League, was held in May, 1929, at the University. After all the district eliminations had been made, more than 2,000 students came to the University for the final contest. Mr. Abe Pepinsky, of the Department of Music at the University, who represented the University in conducting the final contest and who held the position of secretary-treasurer of the league for that year, made the following report:

We staged this year the biggest Convention in our Music Contest history, approximately 30 per cent more than the year 1927-28. We regained the interest of the Range towns lost to us for the past two years. I was personally invited to conduct

their music festival while at Chisholm and greatly enjoyed the good work done by them. I was also called as an adjudicator to Rochester and Sleepy Eye for their district elimination.

When I began this year's project, I had three important items in mind. In the first place, I felt it desirable to raise the standards of the test piece selections for in the beginning of the Contest idea, the literature was hardly worth fighting for; and although many music supervisors criticized us for overreaching, they went to work conscientiously and succeeded most admirably. In the second place, I am not at all sure that the Contests alone will continue to serve as a stimulant for the music educators' motivation program, so that I did all in my power to incorporate more sincerely the festival idea; thereby obviating the necessity of spending too much time in the preparation of the test pieces. A competent critic might well assist the supervisor and school administrator by pointing out weaknesses in the laboratory. Chamber music is my own hobby and I was surprised and delighted with its reception. Here we have music for the home that can well be taught in our public schools. The demand has now been created and I sincerely hope that we shall continue to foster it.

Never in my experience and association with the Music Contest have we had such a fine spirit of whole-hearted co-operation on the part of the entire music faculty of our University. We feel tremendously encouraged and justly proud of the repeated congratulations from any number of the "old-timers" who expressed delight with the smoothness, lack of hysteria, freedom from conflict, and absence of haggling over awards.

When Mr. Zelner took over the work of the music contest in the fall of 1929, he was handicapped by the fact that both Mr. Pepinsky and Director Richard R. Price were on leaves of absence, and there was no one with experience in conducting the music contests with whom he could advise. Due, however, to Mr. Zelner's ability and patience, and his ability to enlist the co-operation of the various departments of the University and the public school officials, he was able to make the Sixth Annual State Music Contest a record-breaking event. In his report Mr. Zelner says in part:

The difficult jobs confronting the committee were: the organization of districts, the publication of a bulletin, arranging for housing, reception of students, supervision of judges, etc. Communications from Music Supervisors and High School Superintendents indicated dissatisfaction in the past on the following points: (1) lack of co-operation on the part of the University; (2) lack of a welcoming attitude on the part of the University through a lack of time for a discussion of the decisions of the judges; (3) poor room facilities for the Contest; (4) lack of educational value of the Contest as a whole; (5) too much stress placed on the Contest and not enough on the festival possibilities.

Two of the outstanding features of the sixth contest were the assembling of all the visiting bands in one great band concert at 4:30 p.m. and the assembling of all the choral voices in one great chorus at 8:00 p.m., accompanied by the orchestra of the Central High School. Over 500 students participated in each of these two great festivals.

Quoting again from Mr. Zelner's report:

During the final Contest and the Festival Band and Choral Concerts, certain features stand out as having had particular value: (1) the massed band; (2) the massed chorus; (3) the singing by selected groups, on the choral program. Other features suggested are: (1) a massed orchestra; (2) discussion, at the time of the festival concert, of the singing of winning groups; (3) increased emphasis on chamber music.

The following data is significant:

1. Of the fourteen contest districts, there were entries from all but one, District 2 of Duluth.
2. In the district contests there were 185 school units in competition, with probably from six to seven thousand students engaged.
3. Eighty-six schools were eligible for the state finals.

MUNICIPAL REFERENCE BUREAU

Information service.—Inquiries on problems of government requiring preparation of special reports to public officials, civic agencies, and private individuals numbered 1,362. This is a slight increase over the number (1,353) for the preceding year. The reports for the biennium 1928-30 are classified by subject as follows:

	1928-29	1929-30
Accounting	34	36
Contracts and petitions	46	22
Elections	64	60
General government	122	120
Health and welfare	50	48
Licenses and permits	52	39
Taxation and finance .....	..	118
Powers and liabilities .....	..	67
Ordinances and resolutions	168	153
Parks and recreations	36	34
Planning and zoning	60	38
Safety	49	105
Utilities	148	149
Public works	82	96
Fees and salaries	43	31
State and Federal Government	65	58
Workmen's compensation	28	26
Miscellaneous	112	162
	1,353	1,362

Minnesota Municipalities.—*Minnesota Municipalities*, the monthly magazine of the League of Minnesota Municipalities, edited at the bureau, now has a circulation of 4,255. It is sent regularly to all mayors, clerks, councilmen, attorneys, engineers, treasurers, health officers, fire chiefs, police chiefs, public utility superintendents, park superintendents, and city and village managers of 360 member municipalities. Twelve issues from June, 1928, to May, 1929, inclusive, contain 491 pages of reading material and 191 pages of advertising. Then from June, 1929, to May, 1930, inclusive, the issues contain 391 pages of reading material and 145 pages of advertising.

Publications.—Special publications issued or about to be issued as a part of a continuing series edited jointly by the bureau and the League of Minnesota Municipalities include:

No. 28. An Analysis of the Generation and Distribution of Electric Power in Minnesota. (1929. 12 pages.)

No. 29. The Determination of Fire Insurance Rates in Minnesota. (1929. 12 pages.)

No. 30. State Supervision of Local Finance. (48 pages. By Edwin O. Stene, instructor, Department of Political Science, University of Minnesota.)

Special services.—The staff of the bureau and the league completely revised the ordinances of the city of Rushford, and the villages of Mora, Osakis, Porter, Rosemount, Shelly, Kasota, Onamia, Cyrus, Sherburn, and Pine City. Revisions are now in process for the cities of St. Cloud and Albert Lea and the village of Young America.

At the request of the official boards, councils, and commissions of the city of Minneapolis, the bureau, together with the League of Minnesota Municipalities, is conducting a survey to report upon the personnel classification and salary schedules for the classified civil service of the city.

Legislative service.—During the 1929 session of the legislature, seven legislative bulletins containing reference to all bills which were of interest to municipalities were prepared and sent to all mayors, clerks, and attorneys in the member cities and villages. Two were included in the league magazine, *Minnesota Municipalities*, and five were mailed as separate publications. Charts were maintained at the bureau, showing the status of these bills and members of the league were in attendance upon all committee hearings of the legislature at which the municipal bills were discussed. Hundreds of special letters and many telegrams were sent to officials. Staff or committee conferences were of frequent occurrence. The League Legislative Conference, held in St. Paul on January 24, 1929, attracted 250 officials from all parts of the state.

Schools and conferences sponsored.—The bureau and the league sponsored and assumed direction of the First Northwest Fire School, a five-day session held at the University August 13 to 17, 1928. This school was attended by 240 fire chiefs and persons interested in fire prevention in Minnesota, North and South Dakota, and Wisconsin. The First Northwest Dairy Inspectors' Conference was held under the auspices of the league at Minneapolis, January 23, 1929. This conference was attended by forty-eight dairy inspectors and health officers. The bureau and the league cooperated with the Minnesota Tax Conference in conducting a two-day conference in St. Paul in February, 1929. Two meetings have been held at the University in connection with the Public Utilities Conference. This conference has been organized as a branch of the league. Twenty-five persons representing the Minnesota Crime Commission and the Bureau of Criminal Investigation, University of Minnesota, and the Police Departments of the first, second, and third class cities, met on invitation of the bureau at the University on January 14, 1929, to make preliminary plans for the conduct of the Northwest Police School. The school is now in process of organization and the first sessions will be held sometime during the coming year. The bureau and the league have lent their co-operation to the University in connection with the Conference on the Small Town which was held at the University June 24 to 28, 1929. Twenty-five committees of the league are at work on various phases of municipal government. Numerous meetings have been held during the biennium to plan, study, and report progress.

Director Richard R. Price represented the league at the annual session of the American Municipal Association at Richmond, Virginia, December 19 to 21, 1928, and Morris B. Lambie, chief of the Municipal Reference

Bureau, represented the bureau and the league at the meeting of the National Municipal League and the Governmental Research Association at Cincinnati, Ohio, October 15 to 17, of the same year, and the meeting of the American Political Science Association at Chicago, December 27 to 30, 1929.

For 1929-30, the bureau, in co-operation with the League of Minnesota Municipalities, sponsored and conducted:

The Second Northwest Fire School, held at the University of Minnesota for five days, September 16-20, with a registration of 330.

The Seventeenth Annual Convention of the League of Minnesota Municipalities, June 11, 12, 13, at Duluth, Minnesota. Attendance, 600.

The Minnesota Utility Conference, March 28, with a registration of 15.

The bureau had a co-operative and participating interest in:

The Minnesota Tax Conference, April 9-10, 1930, with a registration of 150.

The Short Course for Milk Inspectors conducted by the College of Agriculture of the University of Minnesota, March 17-19, 1930, with a registration of 30.

On frequent occasions, one-day conferences were conducted for special committees of the League of Minnesota Municipalities.

The bureau has acted as the central staff headquarters for the Conference on Governmental Relationships—Areas of Administration, to be conducted at the Summer Session of the University, July 15-18.

Representatives of the bureau and the League of Minnesota Municipalities attended the following conferences: American Municipal Association, Chicago, November 14-15; National Police Conference, Chicago, November 11-12; National Conference on Improving Government, Chicago, November 12-14; National Fire Waste Council, Chicago, November 12-15; Traffic Regulation Conference, Office of State Highway Department, October 18; Second Annual Law Enforcement Conference at the Minnesota State Capitol, December 28.

Library service.—The special library of the bureau, in combination with the Bureau for Research in Government, the Department of Political Science, and the League of Minnesota Municipalities, contains approximately 17,000 books and pamphlets, occupying 625 feet of shelves. Accessions of the last year numbered 2,092 pamphlets and reports. Sixty periodicals have been received monthly. There were 1,389 books and reports loaned for the year 1928-29. For the year 1929-30, there were 1,255 loans of library material to students and 340 to municipal officials.

Staff.—The Municipal Reference Bureau and the league unite in furnishing a staff to carry on the co-ordinated work of the two organizations. The chief of the Municipal Reference Bureau also acts as executive secretary of the league. The director of the General Extension Division holds the office of secretary-treasurer of the league. The bureau employs a librarian half time and two stenographers. The league contributes two senior staff members, both attorneys, one full time and one half time, two graduate students half time, one an attorney, a business manager for the magazine, *Minnesota Municipalities*, and an office manager.

The year 1928-29 may be recorded as a period containing the utmost of co-operation on the part of the staff, the league, and the officers, and municipal officials in advancing the highest ideals for municipal administra-

tion and good government in Minnesota. All actions individually and collectively have been motivated by a scientific spirit in an effort to provide the advantages of research facilities, the meeting of minds, and the exchange of experience, and the co-ordination of minds and hearts in the service of the state.

For the year 1929-30, there have been no changes in the staff of the bureau.

Projects.—In addition to the regular activities, the staff members of the bureau and the League of Minnesota Municipalities have completed work upon the following reports or surveys:

Financing education in the state of Minnesota by the property tax, including the University of Minnesota, the teachers colleges, and state aid.

An analysis of revenues, funds, and expenditures for the state of Minnesota.

Compilation of tax rates and property valuations for counties, cities, and villages.

Compilation of rates and other data for public utility services, including electricity, water, gas, central heating, and telephones.

Compilation of data upon indebtedness for counties, cities, and villages.

Compilation of data upon exempt property for counties, cities, and villages.

The grading of municipalities to determine fire insurance rates.

Regulation of billboards.

Data regarding election procedures.

Regulations of trades, professions and occupations in Minnesota.

Projects in process include:

Rank order and decile studies for cities and villages in connection with tax rates, property valuations, yields, indebtedness, exempt property, and utility rates.

A police manual for Minnesota.

Cost of government in Minnesota.

UNIVERSITY RADIO PROGRAMS 1928-29

An analysis of the broadcasting from WLB for the year 1928-29 shows that the University broadcast a total of 160 hours in 30 weeks, or 5.3 hours per week. The time was divided up under the following headings:

- | | |
|---------------------------------------|--|
| 1. Organ recitals—30 hours | 5. Symphony di Camera—4 hours |
| 2. General interest topics—29 hours | 6. General campus and student interest programs—26 hours |
| 3. Modern language hour—30 hours | 7. Basket-ball—16 hours |
| 4. Department of Agriculture—25 hours | |
| Total—160 hours | |

For the year 1929-30, the analysis shows that the University broadcast a total of 196 hours in 30 weeks, or 6.5 hours per week. During the winter, Station KFMX of Carleton College at Northfield discontinued broadcasting and divided its time between St. Olaf's College and the University of Minnesota, giving us an addition of 3 hours for broadcasting from that date. During the year 1929-30, the University installed a new 1-kilowatt station on the university recreation field outside the city limits. With this new equipment we are enabled to avoid interference with other stations within the city limits, and to reach a broader area of nearly four times the radius of the old station.

The organ recitals, during the past biennium, were broadcast by remote control from the Music Auditorium under the supervision of Professor George H. Fairclough.

The general interest topics hour in 1928-29 was divided into four periods of fifteen minutes each, making a total of 116 periods. These periods were taken up by members of the following departments:

- | | |
|----------------------|--|
| 1. Sociology | 6. Dentistry |
| 2. Political Science | 7. Electrical, Civil, Mechanical Engineering |
| 3. Physics | 8. Institute of Child Welfare |
| 4. Philosophy | 9. Speech |
| 5. History | |

UNIVERSITY RADIO REPORT 1929-30

During the school year of 1929-30, the University Radio Station, WLB, was on the air a total of 196 hours in 28 weeks of broadcasting, which is an average of 7 hours per week.

Evaluating the above "time" at \$50 per evening hour, and \$25 per day time hour, which is a low estimate for a station of WLB's power and location, the University may be credited with a total of \$9,000 worth of broadcasting.

According to data compiled by Station KSTP, the publicity on WLB programs for the year in Twin City newspapers only, exclusive of program listings, amounted to 676 inches or 9,464 agate lines.

Evaluating the above at 25 cents per agate line, the University received newspaper publicity through its broadcasting activities worth \$2,366.

The above résumé of broadcasting, and its valuation, does not include a series of seven fifteen-minute programs beginning Monday, April 7, at 8:45 p.m. and presented each week at the same time over KSTP by remote control from the campus studio. This series was arranged by the WLB staff in connection with the Minnesota State High School Music Contest, and took advantage of the greater range of listeners which the more powerful KSTP transmitter afforded. This method of co-operation with a commercial station enabled the university station to receive considerable comment, publicity, and good-will in connection with the above state-wide project, and it is hoped that in the future all commercial station broadcasts of campus events may be handled in this way.

Programs.—The total time of 196 hours was utilized by various programs, as follows:

Subject	Hours	Per Cent
Modern language	42	21.4
General interest topics	4	2.0
Department of Speech series	5	2.5
Department of Music recitals	14	7.2
Department of Agriculture	3	1.5
Fairclough organ recital	18	9.2
<i>Alumni Weekly</i>	28	14.3
University Press authors nights	4	2.0
University Press educational series	2	1.0
Pre-freshman guidance	5	2.5
Debates	7	3.5
Public health	4	2.0
Athletics	10	5.1
Sustaining features	50	25.8

Modern language radio courses which consisted of one preliminary discussion and twenty-seven weekly lessons in German, French, and Spanish were arranged in answer to numerous letters received in the early fall requesting that these instructive broadcasts be continued along the same lines as last year's modern language program.

The general interest topics program consisted each week of a fifteen-minute talk by a member of the staff of the School of Business Administration on such topics as bank mergers, reparations, and employment conditions.

The Department of Speech series consisted of twenty fifteen-minute programs presented on Tuesday at 7:45 p.m., featuring discussions by members of the above department on topics such as stuttering, persuasive methods, etc. These explanatory talks were supplemented at occasional intervals with readings from current literature.

The Department of Music recitals were presented throughout the entire year on Wednesday evenings at 7:00 p.m., and consisted of half-hour programs arranged by Burton Paulu under the advisory direction of Professor Carlyle Scott.

The Department of Agriculture programs consisted of a series of six half-hour presentations on Tuesday evenings at 8:30 p.m. during the fall quarter. The program was sponsored by the Extension Division of the University's Department of Agriculture, and was made up of pertinent reports and surveys on Minnesota farming, as prepared by members of the farm school staff.

The Fairclough organ recitals were played by Professor George H. Fairclough, who has now completed his sixth year before the microphone. The program was heard each Friday afternoon throughout the year, beginning at 4:00 p.m. and lasting as long as the Music Auditorium was available.

The *Alumni Weekly* hour was a popular program presented each Friday evening at 6:30 p.m. during the entire year, featuring campus news together with musical "relief" by student entertainers and orchestras. The news angle of this broadcast was arranged by Mr. William S. Gibson, editor of the *Minnesota Alumni Weekly*, and the program usually consisted of approximately twenty minutes of these talks and news items by prominent alumni members, student leaders, and campus athletes, the other forty minutes being taken up with the musical presentations.

The University Press authors nights series began Wednesday, January 12, at 8:30 p.m., and continued for eight weeks. This half-hour presentation was sponsored by the University Press as the name implies, and was planned to acquaint a wider circle of people with the University Press books and their authors.

The University Press educational series which began Wednesday, March 5, at 7:30 p.m., and continued for four weeks, was also sponsored by the University Press and was intended primarily for parents and relatives of present and prospective college students. The most discussed phases of various educational problems such as "A Bigger Job and How To Do It Better" and "Who Should Go to College?" and "Are University Classes Too Large?" were completely analyzed by eight members of the

university faculty who have gained international prominence in educational endeavor.

The pre-freshman guidance program was presented once each week during the entire spring quarter, and consisted of a half-hour program each Wednesday evening beginning at 7:30 p.m. The purpose of the program was to assist high school seniors throughout the state in their choice of a career by the advice and explanations offered by the deans of the various schools and colleges of the University. Facts of utmost importance to prospective students were discussed each week by these deans who were introduced to the radio listeners by Professor Oscar Burkhard, director of Freshman Week, who also included on each program the answers to the most important questions asked by those students who wrote to him in connection with their problems of matriculation.

The debates consisted of a series of seven one-hour programs presented during the spring quarter on Monday evenings from 8:30 to 9:30 p.m. Each week current controversies such as chain stores, prohibition, and married women in industry were discussed by four members of the University Intercollegiate Debate Squad.

Publicity.—Inasmuch as “fan-mail” has dwindled to such meager proportions as to be no longer a true indication of a program’s value, newspaper publicity is now recognized even by the Federal Radio Commission as one of the most important “measuring sticks” of a station’s value in respect to the best public interest, convenience, and necessity. This is to a considerable extent quite true, because those programs which receive the most publicity are the ones which the editors decide will be most interesting to the greatest number of listening readers. In this way a good program is given advance notice which will induce even more people to participate in its reception than the same program broadcast without advance publicity.

Each week during the year the programs of the university station were incorporated in a “news release” sent to all Twin City newspapers as well as to the Associated Press, United Press, and the *Minnesota Daily*. The return on the Twin City publicity only, exclusive of program listenings, syndicated releases, and *Minnesota Daily* “write-ups,” as tabulated by the KSTP News Bureau are for each month as follows:

Month	Inches
October	23
November	15
December	46
January	72
February	59
March	135
April	143
May	183
Total	677

Equipment.—The transmitting equipment used during twenty-seven of the twenty-eight weeks on the air was the old 500-watt transmitter located on the campus. This “blanketed” receiving set, located adjacent to the

campus, was the cause of quite a few complaints. These complaints, tho regrettable, were nevertheless valuable in determining what the listeners did not want to hear, and thus assisted in the planning of the spring program schedule which not only increased publicity but practically eliminated the antagonistic telephone calls of unwilling listeners. However, with the new 1,000-watt transmitter located on the university recreation field, now in operation, the above difficulty should be entirely eliminated. Moreover, because of the new equipment the tone-quality of the broadcast should be greatly improved, and the programs should now be dependably available to all modern receiving sets located in the state of Minnesota, except perhaps in more remote corners.

It is the writer's opinion that the office of the director of radio broadcasting should be essentially an executive and advisory one, charged with the supervision, arrangement, and production of university programs, and that the individual departments should be responsible for arranging correlated material to be broadcast under their names. The individual departments should also be responsible for getting on the air once each year if the volume of broadcasting warrants it.

It is also the writer's opinion that the best results in radio broadcasting will be had if *one man* from each department were to give the series offered by that department. This man should be a man possessing natural radio personality. The radio audience will then soon become acquainted with the individual and listen for him on the air if they like what he has to offer. Whether this man should write all the papers as well, or simply be the department representative for service at the microphone during the year, is perhaps an open question.

The writer hereof has been the acting director of the University Extension Division during the year 1929-30. He has been serving in the place of Dr. Richard R. Price, director of the General Extension Division, who has been spending his time in Europe, studying and observing so far as opportunity has presented itself, the methods and practices of adult education abroad. Mr. Price provided the material for this report so far as it concerns the first half of the biennium.

Respectfully submitted,

THOMAS A. H. TEETER

Acting Director of University Extension

THE SUMMER SESSION

To the President of the University:

SIR: I submit herewith the report of the Summer Session of 1929 and of 1930, as of June 30.

Attendance.—The total registration in 1929 (including 1,624 duplicates) was 7,491.¹ Net total registration in 1929 (excluding duplicates) was 5,867.¹ The registration was 174 less than it was in 1928. Just what occasioned the loss is problematical. It is possible that the unusually large registration of 1928 (597 more than in 1927) was due to the annual meeting of the N.E.A. in Minneapolis. Many teachers, no doubt, found it desirable to combine attendance at the meeting with their summer session work. A lessened enrolment for 1929, however, has been reported by many of the summer sessions of the country and the condition seems to have been quite general.

The registration for the first term of the 1930 Summer Session shows a total as of June 30, of 5,445.* This figure may be compared with the corresponding total of the first term of the 1929 Summer Session which was 5,294.* A gain of 151 is gratifying in view of the tendency toward lowered registration reported by many institutions offering summer courses in 1929.

Geographical distribution.—Summer session students were in attendance in 1929 from 43 states in the Union, from the District of Columbia, and from 13 foreign countries.

SPECIAL PROJECTS, 1929

Added distinction was given to the 1929 Summer Session by the presence on the campus of eminent men in various fields who took part in special projects sponsored by the University.

a. Fine Arts. In addition to the regular art courses, a special series of lectures and demonstrations was given during the first term by artists of prominence. Alfred M. Brooks, lecturer; Stirling Calder, Gutzon Borglum, and Lorado Taft, sculptors; and John Norton, painter, were on the program.

b. Conference on the Problems of the Small Town. This conference, held June 24 to 28, undertook to make a study of the various questions affecting the economic and social life of the small communities. Addresses and round table discussions by prominent men outside the faculty and on the faculty brought out significant facts which have since been published in book form by the University Press.

c. A Symposium on Physiology and Biochemistry was held from July 15 to August 15. Several of the world's most distinguished physiologists and biochemists were the guests of the Medical School and the Mayo Foundation. Each lectured on the subject in which he had done outstanding research. The following scientists were present: Professor M. von Frey of Wurzburg, Germany; Professor E. Laqueur, Amsterdam, Holland; Professor T. Thunberg, Sweden; Professor G. v. Anrep, Cambridge, England; Dr. H. Strughold, University of Wurzburg, Germany. The attend-

¹ This figure includes internes and nurses in hospital service and fellows at the Mayo Foundation.

ance at the lectures varied from 30 or 40, to 250 or 300 depending upon the appeal of the subject presented.

d. Symposium on Chemical Kinetics. This symposium was held from July 29 to August 31. As it came during the second term of the Summer Session, the attendance, particularly of graduate students, was not so large as it would have been if it had been possible to hold the symposium during the first term. Professor Hugh Taylor of Princeton and Professor M. Polanyi of the Kaiser Wilhelm Institute, Berlin, were guests of the University and joined with our own chemists in making the symposium a success.

SPECIAL PROJECTS, 1930

a. Fine Arts. The special emphasis placed on the fine arts in the 1929 Summer Session is being continued in the current session of 1930. Professor Ernest DeWald of Princeton University lectures during the first term on "Italian Painting and Its Influence on Northern Painting." A series of demonstration lectures in sculpture is being given by Edward McCartan of New York. John Norton of Chicago will follow with a similar series in painting.

b. Symposium on the Kidney in Health and Disease. Invitations were issued by the University for this symposium which was held July 7 to 18. Professor F. Volhard, Frankfurt-on-the-Main, Germany, and Dr. Poul B. Rehberg of the University of Copenhagen, were among the eminent specialists taking part in the program.

c. A Conference on Problems of Legal Administration was held July 8 and 9. Altho this conference is a university project, it assembled in Duluth in connection with the annual meeting of the State Bar Association.

d. A Conference on Governmental Relationships—Areas of Public Administration was held at the University July 15 to 18. Relationships in Law Enforcement, in the administration of public utilities, in public finance, and in public health administration were discussed.

e. A Symposium on the Tariff and the Northwest is planned for July 18. Speakers who accepted invitations were Dr. E. G. Nourse, director of the Brookings Institute of Economics, Washington, D.C.; Professor Jacob Viner, Department of Economics, University of Chicago; and A. B. Gilbert, secretary of the Minnesota Plan for Farm Legislation, Minneapolis. John E. Casey, president of the Minnesota Editorial Association, was temporary chairman.

Convocations, 1929.—The convocations held at 10 a.m. each Thursday of the first term were well attended. Those who gave stimulating addresses were: James C. Lawrence, Carl Russell Fish, Vachel Lindsay, and Carroll R. Reed. Professor Emeritus Henry F. Nachtrieb gave the commencement address.

Convocations, 1930.—The following convocation speakers were secured for 1930: Judge Florence C. Allen, Dr. Samuel Colcord, Miss Maud Scheerer, Dr. John W. Wilce, Major John L. Griffith, and Professor Raymond Moley. President J. N. Brown, of Concordia College, gave the commencement address.

Recreation, 1929.—The usual recreation program of athletics, dramatics, musical entertainments, and excursions was carried out. The large attendance at these events seems to warrant their continuance as an important feature of the Summer Session.

Recreation, 1930.—The new Northrop Memorial Auditorium has made it possible to add attractions to our recreational program of a more ambitious character than has been deemed wise in the past. A Summer Concert Course was arranged consisting of the following numbers: The Fisk Jubilee Singers; Alberto Salvi, concert harpist; The Chicago Art

Theatre in Sudermann's "The Fires of St. John"; and von Flotow's light opera "Martha." The presentation of "Martha" was an innovation in opera production. Four well-known opera singers sang the principal rôles. The action was carried out largely in silhouette-pantomime by actors especially trained for the occasion. Paul Althouse, of the Metropolitan Opera Company, Eunice Steen, Maria Matyas, and Howard Laramy of the American Opera Company were secured to sing the leading rôles. The chorus of University Singers was under the direction of Professor Earle G. Killeen. The acting was directed by Professor Lester Raines, former dramatic coach at the University.

Respectfully submitted,

HARLOW C. RICHARDSON, *Associate*
Director of Summer Session

THE DEPARTMENT OF PHYSICAL EDUCATION AND ATHLETICS

To the President of the University:

SIR: I submit herewith a report for the Department of Physical Education and Athletics for the academic years 1928-29 and 1929-30.

Noteworthy progress has been made in the basic required courses in physical education for men in the biennium marking this report. The reorganization of this work establishing it on the basis of college credit with honor points as provided for other educational courses in the University was brought about this year. This course in required physical education was first made a requirement in the College of Science, Literature, and the Arts in 1898. While the general objectives of the course as now outlined are the same as those obtaining for the University as a whole, its more specific objectives may be defined as follows:

a. To provide wholesome physical education activities in situations that are developmental of organic and functional power and skill as related to (1) general bodily well-being, (2) recreation, (3) successful carrying of the student load, and (4) adequate preparation for life's demands and opportunities in college and thereafter.

b. To give each man a personal physical education in the water sufficient for (1) self-preservation, (2) ability to rescue a fellow human being in an emergency, and (3) ability to utilize the physical education values inherent in aquatic activities.

c. To provide opportunity for the physically handicapped. (1) To remedy their condition as far as possible in the period for which they are assigned to orthopedic physical education activities, and (2) a program in physical education rich in developmental and recreative activities and modified in accordance with their personal and group functional limitations. It is widely recognized that this handicapped group has been particularly deficient in learning physical education play activities.

The placing of the required freshman physical education (Physical Education 1-2-3) on the credit basis has greatly improved the course. Instead of a general tendency to "cut" classes and request excuses, the men as a whole are now willing and happy to attend classes regularly.

Beginning this year all classes in required courses met three times per week instead of two as was done heretofore. The required course in hygiene (Phys. Ed. 4) was merged with the other courses (Phys. Ed. 1-2-3). Each section received four lectures per quarter in hygiene, all of which were given by Dr. Cooke. The total of twelve lectures for the year, being now better distributed throughout the year and more closely related to life activities, is the equivalent of Physical Education 4 (Hygiene) as it was taught in previous years.

The content of the courses was changed, considerable emphasis being placed upon the learning of activities which are not only educational and

healthful, but which also have valuable carry-over qualities and can be easily and beneficially pursued after the physical education requirement is completed and after graduation. Such activities as swimming, touchball, volley ball, handball, squash racquets, and diamond ball are included. In order to insure a fairly complete knowledge of these games each student is required to participate in all of the activities and to learn thoroly the rules of the various sports. Complete examinations of the objective type on the rules of the games are given to each class during and after having finished the competitive schedule in each sport. Final grades are determined from attendance records and examinations.

Registration and grades received for the years 1928-29 and 1929-30 are as follows:

1928-29								
Quarter	Enrolled	A	B	C	D	I	F	Canc.
Fall	1237	314	296	203	77	41	153	153
Winter	996	99	297	312	71	10	91	116
Spring	803	141	238	229	37	5	100	53
1929-30								
Quarter	Enrolled	A	B	C	D	I	F	Canc.
Fall	1132	85	208	299	158	90	145	147
Winter	931	95	207	334	121	52	53	68
Spring	820	82	179	235	151	42	97	34

Medical and physical examinations for all entering men were again conducted jointly with the University Health Service. During Freshman Week, 2,194 were examined in 1928-29 and 2,155 in 1929-30; 542 petitions for exemption from drill or required physical education or both were requested in 1928-29 and 482 in 1929-30; 349 of these were approved in 1928-29 and 338 in 1929-30.

The annual special illustrated lecture on sex hygiene, by Dr. L. J. Litzenberg of the Medical School, with required attendance on the part of all students entering the University for the first time, was again given during the first week of the fall quarter.

Of 308 students in 1928-29 and 291 in 1929-30 who were unable to pass the swimming requirement on entering the University and were therefore registered in elementary swimming only 8 failed to pass the required test by the end of the regular college year in 1928-29 and only 3 by the end of the year 1929-30.

Altho our attainment of these objectives is indicated in a measure by the improvement brought about in students as disclosed by examinations of the objective type, yet the total outcomes are far from satisfying to staff members of the department. Factors retarding attainment of objectives are:

a. Limitation of course requirements to three hours per week. The personal advancement in physical education of any given student would probably be greatly increased by short daily experiences in instructional or recreative physical education activities. At present the department seeks

to provide such supplementation of the program through intramural athletics.

b. As yet the required course in physical education is limited to the undergraduates of the College of Science, Literature, and the Arts for the freshman year only. It has been an aim of the department to extend this requirement to other colleges of the University and beyond the freshman year. Our staff feels that an adequate program of physical education will be helpful to all members of the University, undergraduates, graduates, faculty, and employees.

Intramural athletics continues to comprise a wide program of activities calculated to meet the recreative and leisure time needs of students and faculty men of the University during all seasons of the year. Special stress is placed on activities suited to later life recreational needs such as tennis, handball, volley ball, squash racquets, golf, swimming, and diamond ball. The golf course on the recreation field continues to grow in popularity. It is expected that during the coming summer the full eighteen-hole course will be completed. The Senate Committee on Intercollegiate Athletics again made available the Minneapolis Arena for ten all-university nights of skating activities to all athletic season ticket holders without extra charge. The sixteen new tennis courts which were added, 13 on Washington Avenue and 3 near the University Armory, are giving a valuable extension in opportunity to students and faculty for learning and participating in this splendid game.

The statistical table given below summarizes intramural activities for the past two years:

INTRAMURAL PARTICIPATION CHART

	1928-29	1929-30		1928-29	1929-30
Baseball	154	237	Skating	650	600
Basket-ball	1,200	920	Skiing	200	220
Bowling	172	164	Squash	105	121†
Boxing	75	175	Swimming	166	86†
Diamond ball	1,051	1,742	Tennis	2,797*	1,323‡
Fencing	35	32	Tobogganing	72	90
Golf	2,635*	2,542†	Touchball	507	523
Handball	225	227	Track	250	217
Hockey	263	265	Volley ball	271	267†
Horseshoes	218	138†	Wrestling	70	75
Indoor golf .....	...	275	Rifle shooting	1,460	1,485
Relays	72	112			
Sigma Delta Psi ..	60	70		12,708	11,906

* For the playing season of 1929.

† Summer session figures not included in this report.

‡ Spring quarter play only.

The growth of the Teacher Training Course has been very marked in the past eight years, in the number of registrations, quality of instruction, and content of curriculum. In the year 1928-29 a total of 93 men were registered as compared with three in 1923-24. The final figures for the present year are not yet available, but the indications point toward an

increase over last year. The addition of Mr. Ralph A. Piper to the teaching staff has made a great difference in the instruction. He has been able to take over most of the practical courses, has aided materially the theoretical work, and improved our gymnastic teaching. The men who graduate are now very well equipped for the conducting of an all-round physical education program.

Evidence of the utility and necessity of the curriculum is found in the fact that all of the men who have graduated have obtained positions and are performing their duties creditably. The requirements of the State Department of Education in physical education are such that a number of men teachers and coaches in the field are finding it necessary to attend either during a regular year or a summer session in order to hold their positions. Many are also enrolling after having completed two years' work in a state teachers' college. Superintendents and principals of the schools of the state are gaining confidence in the graduates of this course and are more and more looking to the University of Minnesota for their physical education teachers.

TABLE OF ATHLETIC RECEIPTS AND ATTENDANCE

NOTE.—The accuracy of the figures given below is not guaranteed by the ticket office.

Item	Attendance		Receipts	
	Home 1929-30	Home 1928-29	1929-30	1928-29
Football	204,083	146,186	\$346,709.56	\$228,239.00
Football guarantee			81,496.78	41,595.20
Basket-ball	30,564	42,379	7,431.00	6,573.50
Basket-ball guarantee				300.00
Basket-ball student tickets			45.00	46.00
Baseball	7,300	5,542	284.00	129.00
Baseball guarantee				600.00
Hockey	10,519	20,049	646.50	1,528.25
Hockey guarantee				100.00
Swimming	250	175	72.25	53.50
Swimming guarantee				225.00
Tennis	890	1,400	518.50	1,266.50
Track tickets	3,480	1,560	2,119.35	810.75
Track guarantee				254.23
Gym and wrestling	450	450	30.25	26.00
Gym and wrestling guarantee				275.00
Student books			58,264.00	45,178.00
Postage			4,318.98	2,547.52
Program advertising				6,694.00
Interest				8,187.27
Field House rental				300.00
Sales of equipment				150.11
Totals	257,536	217,741	\$501,936.17	\$344,478.63

The outstanding data regarding intercollegiate competition for the past two years is summarized in the following table:

STATISTICAL TABLE ON INTERCOLLEGIATE ATHLETICS FOR 1928-29 AND 1929-30

Head Coach and Activity	Total No. Games		No. Confer- ence Games		No. Non- Conference Games		Total No. Receiv. Ath. Instruction Including Freshmen		No. Varsity Candidates		No. Varsity Cand. Elig. for Intercol. Competition		No. Having Intercol. Competition		No. "M's" Awarded		No. Fresh. Candidates		No. Numer- als Awarded		No. Games Won		No. Games Lost		No. Games Tied		Place in Conference Meet	
	28-29	29-30	28-29	29-30	28-29	29-30	28-29	29-30	28-29	29-30	28-29	29-30	28-29	29-30	28-29	29-30	28-29	29-30	28-29	29-30	28-29	29-30	28-29	29-30	28-29	29-30	28-29	29-30
Baseball	16	29	11	10	5	19	147	124	92	62	23	23	19	16	11	11	55	62	20	14	6	17	10	12	0	0	..	..
A. J. Bergman																												
Basket-ball	17	17	12	12	5	5	220	201	55	41	18	14	13	10	10	11	165	160	15	14	4	8	13	9	0	0	..	..
David MacMillan																												
Cross country	4	4	3	3	1	1	55	88	15	35	16	13	10	9	2	2	40	53	7	7	1	2	2	2	1	0	6	5
E. W. Iverson, 28-29																												
S. W. Finger, 29-30																												
Football	8	8	6	5	2	3	233	236	78	84	67	76	28	30	24	26	155	152	51	46	6	6	2	2	0	0	..	..
C. W. Spears																												
Gymnastics	2	6	2	3	0	3	32	40	17	24	8	11	8	8	2	6	15	16	..	7	0	4	2	2	0	0	6	3
W. K. Foster, 28-29																												
R. A. Piper, 29-30																												
Golf	3	5	3	3	0	2	12	11	12	11	7	6	4	5	4	2	..	..	..	..	3	2	0	3	0	0	*1	3
W. R. Smith																												
Hockey	17	18	8	8	9	10	93	111	36	49	17	16	15	13	12	12	57	62	15	15	74	6	2	10	1	2	*	..
E. W. Iverson																												
Swimming	10	9	4	4	6	5	94	50	38	22	16	16	13	13	8	10	56	28	15	14	6	5	4	4	0	0	6	3
Niels Thorpe																												
Tennis	4	6	4	5	0	1	41	67	41	32	12	8	9	8	6	7	..	35	..	10	2	4	2	2	0	0	..	†
Phil Brain																												
Track	5	5	5	5	0	0	215	164	90	80	31	25	32	24	10	13	125	84	24	22	0	1	5	4	0	0	..	..
S. W. Finger																												
Wrestling	6	5	5	5	1	0	93	109	56	67	21	19	10	9	6	5	37	42	12	11	2	1	3	4	1	0	..	..
Blaine McKusick																												
Totals	92	112	63	63	29	49	1235	1201	530	507	236	227	161	145	95	105	705	694	159	160	44	56	45	54	3	2	..	..

Football B Team awards: 1928-29, 31; 1929-30, 34.

* Conference team champions.

† Tied for first place in conference dual meet championship.

Annually during the past two years the department has conducted the following tournaments for the Minnesota State High School League:

1. State High School Track Meet
2. State High School Tennis Tournament
3. State High School Golf Tournament
4. State High School Swimming Meet

In all of the instances we have been merely the agents of the league. For the past eight years we have followed the policy that the jurisdiction and control of these meets rests primarily with the State High School League. We have placed our leadership at their disposal.

The department also rendered much assistance to the league in the State High School Basket-Ball Tournament which was again conducted in the Field House.

On invitation staff members of the department have also given a large number of talks on physical education and athletic topics before service clubs, churches, and high schools. Most of these requests fall on the football coach and director. Mr. Crisler filled about one hundred such engagements out of two hundred thirty-six requested this spring.

Detailed reports of the various department activities prepared by the staff members in charge of these activities are on file in this office for more detailed information.

The biennium marks also a change in the leadership of the department, Mr. F. W. Luehring resigning the directorship held during the past eight years and Mr. H. O. Crisler being appointed the new director, beginning with the spring quarter of 1930.

Respectfully submitted,

F. W. LUEHRING, *Director*

THE DEPARTMENT OF PHYSICAL EDUCATION FOR WOMEN

To the President of the University:

SIR: I beg to submit my report of the work of the Department of Physical Education for Women for the biennium 1928-30.

REQUIRED PHYSICAL EDUCATION

Academic credit was granted in the spring of 1929 for the courses that fall within the requirement, by the Colleges of Science, Literature, and the Arts, Education, and Agriculture. Heretofore these courses have been "non-credit" courses. The amount of credit granted by the various colleges depends on local conditions and each differs from the others. The College of Science, Literature, and the Arts has granted 3 credits for two years of work, the College of Education 5 credits for two years, and the College of Agriculture 4 credits for four quarters of work. In each case the college has increased its requirement for graduation by the number of credits granted to physical education. The credits in each case are equivalent in all ways to credits for academic courses, including honor points for high grades.

As one result of this change, the hygiene course became part of the physical education course during one quarter, occupying an additional hour as before, but becoming the lecture hour of a lecture-laboratory course, for which one grade was sent to the registrar.

The Departments of Physical Education for Women and Physical Education and Athletics acted jointly in requesting academic credit for the required courses.

The anticipated benefits of academic recognition of student effort have been more than borne out by results. There has been marked improvement in attitude, and evidence of increased interest. Absences have decreased, there is great demand for mimeographed material, and students ask for special help in preparing for final examinations.

For two years this department has been co-operating with similar departments in certain other institutions in an experimental program in which the fundamental purposes in physical education for college women and the means for securing their realization have been uppermost. Conferences have been held during the past four summers, during the two weeks of which principles and applications have been discussed and the delegates have then gone back to their own institutions to experiment with methods for getting the desired results. The Universities of Iowa, Michigan, Ohio State, Washington, Wisconsin, Chicago, and Oregon Agricultural College have been represented. Miss Baker, Miss Warnock, and Miss Timberman have represented this institution.

The factors considered fundamental for the program in psycho-motor education are the following: co-ordination, speed of movement, flexibility, endurance, strength, rhythm, and relaxation. These factors have application in three general groups of activity—dancing, sport skills, and skills of daily life. In the development of these abilities, simple practical problems have been set for the students or by the students themselves and opportunity has been given for experimentation, discussion, or analysis. Each girl thus experiences many varied motor activities and is taught to make intelligent application of general principles to these activities. The carry-over from the skills practised in the winter quarter to some of the sports of the spring quarter of this year was gratifying, especially in baseball and track. The interest of the students in tackling these problems and their satisfaction in their own improvement is gratifying and indicates the desirability of further development of the method involved.

Correlation between the lecture hour and the gymnasium hour has been worked on during the past two years, the gymnasium illustrating through exercise many of the principles and arguments brought out in the lectures. For instance, after the lecture on Feet and Shoes each girl was given the opportunity of seeing her own feet through a fluoroscope, one shod and the other unshod, and observing if the foot and especially the toes had enough room in the shoe. Special corrective foot exercises were given to all with explanations of their effects.

Twelve per cent of the entire class enrolled for Elementary Physical Education were being taken care of in the orthopedic division of work, because of conditions which could thus be helped or which made vigorous exercise inadvisable. Among these students were found the following conditions:

Poor posture and faulty body mechanics	201
Scoliosis	107
Foot abnormalities	147
After-effects of accidents or operations	13
Malfuction of organs	69
The handicapped who needed protection from fatigue, increased heart rate, muscle pull, etc.	158

The orthopedic division brings the student to a correct understanding of her condition, helps her to appreciate its true significance if it imposes limitations on her, enables her to arrest, improve, and, in cases of weak posture and functional scoliosis, to cure the condition. It always endeavors to stimulate her to a desire to know how to get the best results from the use of her body.

SOPHOMORE REQUIREMENT

The choice of the sophomores which is made from thirteen elective activities is limited only by two factors: the physical fitness of the student for the activity and the requirement that all girls who do not know how to swim register for Elementary Swimming.

Certain trends in their choice are of interest. They are choosing in

larger proportion those activities which they may continue to participate in after graduation. The significance is not entirely clear, since those are also to a large extent activities which do not require a change of dress, but it is suggestive as indicating a desire to fit themselves for recreation. Sections have had to be closed in hockey, basket-ball, baseball, and track, while new ones have been opened in tennis, golf, archery, outdoor skating, horseback riding, and advanced swimming. Basket-ball continues to hold its own as the most popular indoor game, however.

HEALTH

Physical examinations.—The classification of the students in physical education was based on a thoro physical examination as heretofore. The examination of all newly entering women students has been done heretofore in the Women's Gymnasium under the direction of the Department of Physical Education for Women, and with the increasingly important cooperation of the Students' Health Service. In the fall of 1929 the Health Service moved into its new abode in the wing of the University Hospital and in these quarters had plenty of room in which to take care of the physical examinations of the women. It also was equipped with all the modern methods of making examination thoro and accurate, and was willing to employ women entirely for the medical examination of newly entering students as had always been done. Therefore, it seemed best from all points of view that the examinations should be done in the Health Service plant and that the direction of the medical portion of them should be in the hands of the Health Service. Five hundred dollars of the amount that had been spent on medical examiners and clerks by this department was made available for use by the Health Service.

This department continued to carry on the photographic part of the examination and the detailed examination of posture, spines, and feet, as well as strength tests. A copy of the entire examination was filed in the office of this department.

The "summing-up" was done in two parts. The Health Service made note of conditions which needed further consideration and made recommendations regarding exercise. The classification of the student for physical education activities was then made by one of the medical members of the Physical Education staff.

In the spring all freshmen had a posture recheck and silhouettograph and the sophomores, in addition to this, had a medical examination. The latter was done at the Health Service this year for the first time, and no sophomores will be given a passing grade in the spring quarter courses without it.

The director of this department was given full access to the records of the students at the Health Service and held an office hour there every week for the purpose of passing on cases of students who desired or had been recommended to drop or change their physical education. Additional cancellations were authorized by the other medical member of this depart-

ment, at the gymnasium, and her conferences with girls regarding minor disabilities reached the number of 416.

PROFESSIONAL COURSE

Endeavor has been made to restrict the enrolment in this curriculum to those students who give promise of making a success in the teaching field. Each student who desires to enter the course must have a personal interview with the director, who tries to size her up on the basis of her personality, college aptitude rating, and previous history. Each fall there are a few applicants who are not approved for the course, but are advised to try another field.

In addition to this, the students who are unusually successful or unsuccessful scholastically in their university courses during the first two years are given encouragement or discouragement, and the latter may be dropped as the result of college rulings.

The department makes an effort also to rate students on their personal qualities and abilities as well as their scholarship and to advise them on the basis of the rating. Student ratings of their fellows at the end of the freshman year and faculty ratings of all students each year are recorded and digested and are then discussed in personal conference between student and faculty adviser. Again effort is made to retain those students with promise and to assist those who rate consistently low to choose some other line of effort. It is very unfortunate to have any student reach her senior year who cannot then be recommended for a position.

RECREATIONAL ACTIVITIES

The ninth hour in the afternoon and the evenings from seven to nine have been kept sacred to recreational activities. There is no other time in the day when the gymnasium is free for them; even the noon period for the last two years has had to be used for scheduled classes. This spring we find that fifty upper-class students who have finished their requirement are scattered among the enrolments in golf, tennis, archery, advanced swimming, and horseback riding, and altho in most instances it increases an already crowded condition they have been allowed to remain.

The Women's Athletic Association has been of the greatest aid in furnishing publicity for the recreational activities, in running off tournaments, and by its recognition of athletic accomplishment in "points" awarded at quite delightful dinners. It has moved its office to Shevlin Hall and is endeavoring to expand and modify its program to meet all interests, and to ally itself more closely with other women's organizations. Points can be gained through participation in the following wide range of activities, each of which has a student head: field hockey, ice hockey, volley ball, tennis, basket-ball, swimming, baseball, golf, horseshoe, horseback riding, hiking, dancing, apparatus, orthopedics, deck tennis, archery, track, bowling.

An indication of the lessening tension in women's team games is given by the fact that the umpiring of tournament games in baseball was done by students in 1928-29 and in 1929-30 field hockey and even basket-ball were refereed by students. The officials did exceptionally well and even in the final game gave complete satisfaction to both teams.

The figures for participation by students in various recreational activities follow:

<i>Fall</i>	<i>Winter</i>	<i>Spring</i>
Field hockey 95	Apparatus 22	Archery 22
Bowling 36	Basket-ball 150	Baseball 121
Volley ball 33	Ice hockey 20	Golf 30
Swimming 78	Tumbling 15	Tennis—singles 60
		Tennis—doubles 20
		Unorganized sports.... 53
		Track 20

The organizations affiliated with the Women's Athletic Association are the Aquatic League, Orchesis (dancing organization), Interhouse League and the Minnesota Hunt Club. The last was organized this year and is an organization interested in promoting and enjoying horseback riding. It put on a very creditable horse show at the Parade Grounds this spring.

The association had an unusually successful Penny Carnival this year (its one money raising event) and cleared three hundred dollars. With it, it sent three delegates to the biennial meeting of the Athletic Council of American College Women, held this year at the University of Michigan.

Play Day for Minnesota Colleges, initiated by the Minnesota W.A.A. in 1927-28 was held at St. Olaf College in the spring of 1929 and at Macalester College in the spring of 1930. Gustavus Adolphus will be hostess in 1931. Six colleges were represented in 1929 and nine colleges in 1930. The idea of these play days is to broaden contacts and to play for the fun of playing. Everyone is given a chance to play and the teams, organized informally, contain representatives from various colleges, so that the girls play "with" instead of "against" members of other colleges. A banquet followed the games this spring and ended with reports and discussions of what each W.A.A. is doing at its own college.

THE STAFF AND THE BUILDING

There have been eleven full time women on the teaching staff, an increase of one over the last biennium.

In the sports seasons the teaching staff expands its operations by means of the practice teaching of the senior major students in hockey, basket-ball, baseball, and tennis. One staff member can act as critic teacher for two sections, and this makes it possible to offer five outdoor sports sections to the groups which must be combined into two classes indoors, since there are only two rooms for them to use. Even with this assistance a teaching load during the outdoor season of 23 to 25 hours is given each instructor, thus increasing her regular program by three hours a week.

The building is more and more crowded each year. The total number of students during the biennium 1926-28 was 3,127 and the number of students during the biennium 1928-30 was 3,527, the increase in the number of students being 400.

The total enrolment in the fall of 1929 was 1,656 while the total number of lockers available was 1,270. The four largest classes averaged 192 while the number of dressing rooms is 168. If a change is made which is being studied now, contemplating a mezzanine floor in the locker room and a change to the self-service box locker system, this shortage should be relieved for years to come and petty thieving of articles of clothing will be stopped.

The overcrowded condition of classes will not be relieved, however, since the two gymnasiums are being used now every hour in the week with the exception of five scattered hours, and there is no chance for creating new classes. The large classes are divided into squads of 10 to do their work, but 3 of them number approximately 125 in enrolment and it can be seen that even in a room as large as 65 by 98 feet there is not space for 12 or 13 squads to move with freedom.

The outdoor conditions are helped out very much by use of the tennis courts on Washington Avenue, where as many as ten courts at once are used by the many classes that elect tennis.

Respectfully submitted,

J. ANNA NORRIS, *Director*

DEPARTMENT OF MILITARY SCIENCE AND TACTICS

To the President of the University:

SIR: I have the honor to submit the following report of the Department of Military Science and Tactics for the period 1928-30:

The end of the two-year period found the Cadet Corps in very satisfactory condition. I believe the efficiency of instruction and the results obtained have shown an improvement and, as a result, the interest of the student body as a whole in military instruction has increased. Efforts along other lines have been made to increase the interest of the student body in military instruction and to improve the morale in the corps. Probably the most effective of these will be the adoption of a distinctive, well-tailored, olive drab uniform for issue to every basic student. This new uniform will certainly afford considerable improvement in the appearance of the corps and increase the pride of the individual in the uniform.

During the past year there has been organized among the Advance Course students a Cadet Officers' Club. This club includes every member of the Advance Course and has as one of its main objectives the promotion of good fellowship among its members. Meetings are held at intervals during the year, at which times the students become better acquainted with each other and with the military faculty members. At these meetings some event of educational value is conducted; for example, during the past year we have had lectures on military history by well-qualified men. During the next year, we expect to have talks on military history, as well as talks on other subjects of educational value.

A company of the National Organization of Pershing Rifles was established at the University of Minnesota in the spring of the past year. This is an honorary unit among the basic students and its members are especially selected. The local company will be of assistance in improving the morale among the first and second year students of the corps.

The following table shows the number of students undergoing military instruction during the various periods covered by this report:

Quarter		1st Yr.	2nd Yr.	Total	1st Yr.	2nd Yr.	Total	Aggregate	
		Basic	Basic		Advanced	Advanced			
Fall,	1928....	1416	1213	2629	142	142	284	2913	
Winter,	1929....	1460	1144	2604	155	133	288	2892	
Spring,	1929....	1202	725	1927	155	126	281	2208	
Fall,	1929....	1672	1214	2886	177	133	310	3186	
Winter,	1930....	1510	1110	2620	176	125	301	2921	
Spring,	1930....	1207	763	1970	178	134	312	2282	
							Attendance at summer camps, 1929.....	127	
							Estimated attendance at summer camps, 1930.....	191	

It will be observed that the number of basic and advanced course students in each quarter of the school year, 1929-30, shows an increase over that in the corresponding quarters of the school year of 1928-29.

I take this occasion to express my appreciation to the administrative officers and college faculties for the fine spirit of co-operation they have shown throughout the past two years.

Respectfully submitted,

JOHN H. HESTER,
Major, Infantry, D.O.L., P.M.S.&T.

THE DIVISION OF LIBRARY INSTRUCTION

To the President of the University:

SIR: I submit herewith a summary report of the Division of Library Instruction for the biennium ending June 30, 1930.

The division, established by the regents in 1928, was formally opened to students with the fall quarter of 1928-29. Unlike any other similar agency on record, it is an instructional unit and not an administrative entity. The curriculum and faculty are under the control of the director of the division. The courses offered are accepted for credit by the various schools and colleges of the University. So far, the year of work outlined by the division is accepted as an equivalent for the senior year in the College of Science, Literature, and the Arts and the College of Education, and students in this division are regularly enrolled in those two colleges.

The attendance has been surprisingly large. About a hundred different students were enrolled in 1928-29 and 102 in 1929-30. Many of these were enrolled for the minimum number of credits advised by the State Department of Education for the various grades of school library certificates. Thirty-eight received their Bachelor's degrees in 1928-29, and 31 in 1929-30. Every full time graduate of 1928-29 but one was placed in a library position or a position including library work. About one half of the full time members of the class of 1930, majoring in library instruction, have so far been placed. The professional unemployment situation in general has seriously affected both the number of vacancies and of new positions.

The results of the two years' experiment have been gratifying. If the present serious handicap of large classes and small teaching staff can be removed, there is every reason to expect results as satisfactory as those obtained in any library school in the country.

Respectfully submitted,

FRANK K. WALTER, *University Librarian*

THE DEAN OF WOMEN

To the President of the University:

STR: The dean of women herewith submits the following report for the biennium 1928-30.

The distribution of women students, as to residence (figures based on census cards supplied by the registrar's office, and by private information obtained by this office) during the regular sessions of the biennium 1928-30, is as follows:

	1928-29	1929-30
At home, or with relatives and friends.....	3973	4080
In approved houses	475	475
In dormitories	200	200
In co-operative cottages	70	55
In home management houses (group changes each quarter)	24	24
Nurses in homes and hospitals.....	256	287
In sorority houses.....	187	209
Working for room and board.....	100	125
Total	5285	5455

Delinquents.—The dean of women has worked in co-operation with Dean Nicholson, Dean Shumway, Dean Freeman, Dean Haggerty, and Dean Lasby. She has served on the Students' Work Committees of the College of Science, Literature, and the Arts, the College of Education, and the College of Agriculture, Forestry, and Home Economics in cases of women students on probation because of poor scholastic work. She has also served on the general disciplinary committee of the University in hearing cases which have been referred to this committee. She has dealt with all individual cases of delinquency of women students from other than scholastic causes, coming to the attention of university officials. It is a gratifying fact that the number of these cases has not materially increased in recent years in spite of the growth of our student body. The number is decidedly small when we consider our student enrolment, and the fact that the University has an urban setting.

Employment.—In accordance with the request of the president's office at the time of the establishment of a central employment bureau for the entire University, all cases of employment for women students have been referred to Mrs. Dorothy Johnson, the head of the Employment Bureau, as have also the calls from employers for women students. The dean of women has co-operated with Mrs. Johnson in advising as to types of employment, in checking on certain types of employment, and in helping to see that employment was suited to the individual girl who needed to earn her way.

Absences.—Excuses for absences, excepting for cases of sickness, have been written by the dean of women. The number has been gratifyingly

diminishing since the inauguration of a stricter policy in 1925. The figures are as follows:

	1928-29	1929-30
Fall quarter	110	29
Winter quarter	46	19
Spring quarter	41	19

HOUSING

Sanford Hall.—Sanford Hall, the university dormitory for women, houses about 200 students. It is filled almost to capacity at the beginning of each fall quarter. There are a number of changes in the original fall quarter enrolment, due to cancellation from the University and entrance of new students during both of the two succeeding quarters.

East and West Sanford, in opposite ends of the same building, act as a unit. A house council elected by the students themselves assists in the regulation of conduct and promotion of interests in the hall.

On the whole, the conduct of the girls has been satisfactory. The necessity for quiet hours has been stressed, and the co-operation of the girls was secured to produce better results. In all cases the director has tried to be reasonable in her discipline, to keep the girls' point of view in mind, but still hold the girls to a high standard of conduct. Students in the hall are treated as women, not children, and usually behave so. There has been a constant aim to make the hall a more desirable and pleasanter place in which to live. One notices the desire of the girls to familiarize themselves with the ordinary social amenities, and their ready acceptance of suggestion.

There is a wide diversity of interests among the residents of the hall, and an attempt has been made to direct them into extra-curricular and campus activities. This has brought gratifying results. Students have participated in the work of the Women's Self-Government Association, the Y.W.C.A., athletics, dramatics, and music.¹

The girls have co-operated in a number of social activities. These have included the formal initiation of the new girls into the Sanford group, luncheons for fathers on Dad's Day, and for mothers on Mother's Day, open house on Homecoming Day, several dances during each year, occasional teas at which members of the faculty were the guests, "get-togethers" for the residents of the hall, and a dinner for the seniors.

¹ During the year 1928-29, Mrs. Ethelyn Harrison was social director at Sanford Hall, and during the year 1929-30, Mrs. Edith Vogel occupied this position. Both women have worked very sympathetically with the students and have accomplished much in providing a constructive social program for the residents of the Hall. At the end of her two years, Mrs. Harrison strongly recommended that a separate budget be provided for the social functions of Sanford Hall. This recommendation has been reiterated by Mrs. Vogel. If the hall is to be the influence in the life of its residents that we all believe it should be, some adequate provision must be made for dignified hospitality and enjoyable contacts. A separate budget, set aside from the income of the hall, and at the disposal of the social director advising with a student committee, is essential if this adequate social program is to be carried out.

Co-operative cottages.—In 1928-29 we housed 70 girls in Loring, Northrop, and the four Winchell cottages. Loring Cottage, housing 14 girls, was removed on July 1, 1929.

During the year 1929-30, Northrop Cottage, housing 18 girls, was filled all year. Miss Ella Clark acted as chaperon. The four Winchell cottages, housing 38 students, have been filled all year. Miss Gina Wangsness was the chaperon at 500, Mrs. Meyers at 511, Miss Lucy Will at 519, and Mrs. Shirley at 504 Beacon Street.

It is with very real regret that our department is forced to relinquish Northrop Cottage to serve temporarily as a nurses' home. We have been able to keep the co-operative cottages filled to capacity; to have one of our largest ones taken from us will seriously cut down a very real service to the girls who need to live at a minimum cost. This leaves only the four Winchell cottages for the coming year.

Home Economics Dormitory.—As in the past, this building has been used for the housing of university students taking work in home economics. Miss Laura Matson is the chaperon.

Rooming and boarding houses.—All houses where students live are inspected and graded according to desirability by the director of the Housing Bureau, Mrs. Catherine McBeath. We are constantly raising the standard of our rooming and boarding houses. Only houses that can be graded "A" and "B" are listed in our approved directory. The monthly meetings of the householders' organizations, composed of the women in charge of rooming and boarding houses, have continued throughout the year. Attendance at these meetings is compulsory for all women wishing to keep their names on the approved list.

An organization of householders for men was formed the past year. This has been meeting regularly once each month. Attendance at these meetings has not been as large as it should have been, but hereafter membership in this organization is to be compulsory if householders desire support from the University.

SUMMER SCHOOL

Our regular printed lists of rooming houses were sent out upon request, and arrangements for other accommodations were made through the Housing Bureau. Shevlin Hall was open for the social activities of women. Sanford Hall was open for both sessions. All of the cottages were open for the first term of the Summer Session, and all but one Winchell cottage open for the second term.

WOMEN'S ORGANIZATIONS

Women's Self-Government Association.—The Women's Self-Government Association is the all-inclusive organization to which every woman student belongs automatically upon registration in the University. It has completed two extremely successful years, the year 1928-29 under the leadership of Miss Miriam Wedge, and the year 1929-30 under that of Miss

Elizabeth McMillan. Both have proved able leaders, constructive in their thinking, and successful in winning the co-operation of a large group of women students to their plans. Their work has followed much the same lines as in previous years, with especial emphasis on providing a constructive social program for all the women of the University. This has taken the form of sponsoring the four class organizations of the women, of providing weekly dances open to all women students, held in Shevlin Hall on Friday noons, of providing at least two class functions for the women of each class each quarter, of holding interprofessional teas and dinners to promote acquaintance among the women in the professional schools, and of holding three to four afternoon dances a quarter open to both men and women. The latter have proved successful from the point of view of financing W.S.G.A. projects, as well as from that of providing enjoyable social contacts.

In the eyes of the Women's Self-Government Association the most important piece of work that it undertakes is the Big Sister work for the incoming freshmen in the fall. During the year 1928-29 Miss Rachel Hanna had charge of this work, and during the year 1929-30 Miss Charlotte L. Larson was its director. The effort is made to see that each incoming student, whether a freshman or upper classman, is assigned to a competent older student who will advise with her and help her to make her adjustment to campus life.

The chairman of the Big Sister work is also a member of the Freshman Week Committee, and works with the other students on the freshman week projects in charge of students. In addition, she sees that a personal letter is sent to every incoming freshman from a chosen upper class student, offering advice and help; that the contact between the older student and the incoming student is made as soon as college opens, and that the work is followed through, so that opportunities for acquaintance and friendship are offered to all of the incoming freshman women. No more unselfish, far-sighted, and well-planned piece of work could be carried on by students than this Big Sister work which originated with them more than ten years ago, and which has been developed to a point of very great efficiency at the present time.

One of the projects in which the Women's Self-Government Association has been interested is that of the second-hand bookstore which they conduct for the benefit of students who wish to dispose of their textbooks which they no longer need, and which also provides opportunity for other students to buy such books at a lowered cost. During the year 1928-29 the income from the bookstore was about \$1,800; during the year 1929-30, it was over \$2,200. This money is immediately turned into the scholarship fund which provides scholarships for women students whose scholastic work is of outstanding caliber and whose need of financial assistance is great. During 1928-29, fourteen such scholarships were awarded, and during 1929-30, sixteen were awarded. These scholarships are for \$100 each.

The board has co-operated with the University in maintaining vocational advising for women students, and has helped to conduct some six

round tables each academic year in connection with the work of Miss Katherine Woodruff of the Woman's Occupational Bureau, who is also vocational adviser for women on the university campus. At these round tables various representatives of occupations in which women have achieved success come to the campus, and meet with students who are interested in their particular field. After a presentation of their line of work, the students are free to ask questions, and these informal round tables have proved one of the most helpful ways of arousing interest in vocational opportunities among the women students. The same plan is to be continued during another year.

The Women's Self-Government Association also carries on a number of other activities, among them a Tutor Bureau, a Dramatic Service Bureau, a Publicity Bureau, a Point System Department, and a department to furnish and supervise the rest rooms for women in all the campus buildings. In addition, the Women's Self-Government Association has tried during the past two years to establish even closer connections between the other all-inclusive university organizations, the Young Women's Christian Association, and the Women's Athletic Association. The Women's Self-Government Association has participated in the freshman discussion groups held by the Young Women's Christian Association, and has contributed leadership in all of the joint projects.

For the last two years the Women's Self-Government Association has worked on an approved budget, and has planned its expenditures in such a way as to apportion its money to the best advantage so that all the students on the campus may benefit from its plans.

The Young Women's Christian Association.—The activities of the Young Women's Christian Association have followed along the same general lines as in previous years. We have been fortunate in having such strong secretaries as Miss Lois Wildy, Miss Marie Shaver, and Miss Katherine Reinhardt. The president of the Young Women's Christian Association for the year 1928-29 was Miss Ida Olin, and for the year 1929-30 Miss Mary Margaret Burnap. Both young women have done fine constructive pieces of work. They have had working with them a small cabinet of twelve members chosen on the basis of their interest and demonstrated ability. The cabinet officers and the elected officers of the organization head the following committees: Membership, Freshmen, Publicity, Worship, Interconfessionalism, Social Service, Finance, Industrial, Racial, Office Hostesses, Social, World Fellowship, Special Projects.

Twelve freshmen discussion groups with average membership of fifteen to twenty, each led by an upper-class student were organized for the fall quarter. During the winter quarter freshman interest groups were organized around the following subjects: appreciation of art, appreciation of poetry, appreciation of music, modern drama, modern fiction, beauty in worship, charm school. Each group was led by an upper classman, faculty member, or secretary. At the close of each quarter the freshman women held a dinner for all freshman women.

A series of meetings and pilgrimages to different churches was planned for the winter quarter for the purpose of providing information and an opportunity for discussion of the characteristics of Catholicism, Judaism, and four points of view in Protestantism—fundamentalism, conservatism, modernism, radicalism. This series of meetings was well attended and a great deal of interest shown by both students and faculty members. During the spring quarter a smaller group studied oriental religions. Professor David Swenson assisted in these meetings.

The World Fellowship Committee has had three projects which they have carried throughout the year: International Forum luncheons held in co-operation with the Young Men's Christian Association, in the Minnesota Union on Tuesday noons, receptions for foreign and American students, and participation in the work of the World's Student Christian Federation.

Once a month the committee on receptions of foreign and American students provided for informal Sunday afternoon receptions in the Young Men's Christian Association Building, or in private homes, for the purpose of providing students and faculty members an opportunity to meet the foreign students in an informal manner.

Because of our affiliation with the World's Student Christian Federation and the World's Young Women's Christian Association, the Committee on Foreign Giving planned a festival of nations dinner during the winter quarter at which there were over 225 guests.

The activities of the Social Committee have been centered about the needs of the undersocialized women students.

Quite a large group of university women have volunteered their services in social service work during the year. Another group of students has met weekly with a group of industrial girls at the Central Y.W.C.A. and this year has made a special study of the working conditions of women and girls in industries in Minneapolis.

For some time there has been a feeling among a considerable group of students that services of worship which would be inclusive of all students, of whatever religious affiliation, should be provided on the campus. During the fall quarter a committee of students representing both the Young Women's Christian Association and the Young Men's Christian Association made a study of worship services and during the winter and spring quarter, vesper services were held in the great hall of the Young Men's Christian Association building each Wednesday afternoon.

For both years of the biennium the representation of Minnesota at the annual summer conference held at Lake Geneva, Wisconsin, has been gratifyingly large. Last year there was a representation of 36 students, and this year of 41 students.

The Women's Athletic Association.—The Women's Athletic Association has had two extremely successful years under the leadership, in 1928-29 of Miss Fanny Burnham, and in 1929-30 of Miss Dorothy Bennett. The aim of the association is to expand its program to meet the interests of as many women of the University as possible, and to ally itself as closely as it may with the other activities for women. It has had an office in Shevlin

Hall for the past two years now. It has expanded its own program of activities to include fencing, archery, the hunt club, and horseshoe pitching. These were added to the regular program of the organization which includes bowling, swimming, basket-ball, golf, tennis, both singles and doubles, base-ball, and an intramural field meet. There has been a distinct endeavor during both years to give the women students themselves a further chance to take over the responsibilities of the organization and coaching of their sports. Ice hockey, fencing, and archery have been entirely student led, tho with faculty advising. The plan of a Play Day in which several neighboring colleges participate has been continued during the two years. In 1928-29 St. Olaf was hostess to six colleges, and in 1929-30 Macalester College was hostess.

During both years an extremely successful Penny Carnival has been held, with the object of raising funds to finance the athletic activities. In 1928-29, there was no national convention of the Athletic Council of American College Women, but in 1929-30, the convention of this organization was held at Ann Arbor in April. The association sent three delegates, the outgoing and in-coming presidents, and a sophomore representative. The delegates came back with many helpful suggestions for the program for next year. It is gratifying to see that a larger number of students are drawn into the Women's Athletic Association activities all the time, and that these students are eager to assume their share of responsibility in planning the work of the organization, while at the same time they are co-operating with the members of the Physical Education Department for Women in furthering the aims of the department.

Sororities.—The present sorority situation at the University is a trifle anomalous, since Panhellenic recognizes only those sororities which are unrestricted as to membership, whether or not they are national. There are twenty national sororities and one local sorority which now comprise the local Panhellenic organization. Two national Jewish sororities and one local Jewish sorority, and the one national colored sorority now on our campus are not members of Panhellenic. The regulations of Panhellenic naturally affect only its own members. This year for the first time Panhellenic adopted deferred rushing, and at the same time put in the ruling that no girl may be rushed or bid by any group until she has completed one quarter's work in the University with an average of "C," and a program of at least ten hours of work. Much remains to be worked out in the provisions for free association between the incoming freshmen and upper class sorority women, so that both may know each other without undue pressure on the time of either. On the whole, the sororities have felt that their action in adopting deferred rushing was not disappointing. They have adopted it for a period of three years with the understanding that the first year would necessarily be experimental, and would show them where they were making mistakes in the kind of rules they are drawing up. The honest effort to live up to these rules has resulted in a much closer knit Panhellenic organization, and in a much freer discussion and interchange of point of view among the members of this organization.

Panhellenic has this year become much more of a force on the campus than at any time during the last eight or nine years. It is really trying to do constructive work both on the scholarship side and on the side of building up better standards. We hope that another year will see very real progress in the wiser selection of members of sororities, and in the better showing that will result in the way of scholarship, tho we have not yet completed the scholarship figures for the entire academic year 1929-30. The figures for the first two quarters of the year show that the scholastic average of all the sororities has risen materially. This was especially evident in the winter quarter, which usually shows a distinct slump in the scholastic average of the sororities, but which this year showed a decidedly higher average for all the sororities than has ever before been compiled in our office. The ruling that the girl must have a "C" average before she may be rushed affects not only the incoming freshmen in the fall, but all of the students who have been on the campus previously, so that no girl can be considered for sorority membership who has not carried at least one quarter's work with an average of "C." It will take some time for the sororities to realize the practical value of this measure, but some of them are already expressing themselves as completely satisfied with its wisdom. Neither the deferred rushing nor the "C" average affect any of the groups not included in Panhellenic.

Shevlin Hall.—Shevlin Hall is in constant use, especially by the various organized groups of women. It serves a great need on the campus. Its social rooms are hardly large enough for the number of group activities that have to be conducted in them, and the women students are forced to take their largest functions over to the Minnesota Union.

The cafeteria is increasingly popular. This year Mrs. Barley has installed small booths with individual lighting, and the increased patronage has justified the outlay. The women's organizations are bringing practically all their functions to the hall at present, and much prefer to use their own quarters in this way. This is a distinct change from four years ago when they sought on every possible occasion to take their functions either to the Minnesota Union, or to some of the eating houses conducted privately near the campus.

Chaperonage.—The chaperonage of all campus parties is under the supervision of the dean of women. The effort to confine parties to Friday and Saturday evenings has been increasingly successful. The meeting of the rooming house chaperons and those of the sorority house chaperons have enabled the dean of women and the head of the Housing Bureau to keep in close touch with this phase of chaperonage.

FINANCIAL AID TO STUDENTS

Loan funds.—The following loan funds are administered through the office of the dean of women:

D.A.R. Sanford Chapter
Faculty Women's Club
Home Economics Self-Government Association
Jessie S. Ladd

Minneapolis Alumnae Association
Minneapolis College Club
St. Paul College Club
Pathfinders' Club

From the Faculty Women's Club loan fund, April, 1928, to April, 1929, 43 students borrowed a total of \$2,337.00; 43 students paid back a total of \$1,655.71. From April, 1929, to April, 1930, 34 students borrowed a total of \$1,567.00; 60 students paid back a total of \$2,033.34. We also have the interest from \$2,000 invested in bonds to add to the loan fund.

Small amounts have been given out as short time loans from the two Alumnae Club loan funds, the College Club, and the Pathfinders' Club—a total of \$2,986.50 given out in loans, and \$2,516.75 was paid on loans.

The D.A.R., Sanford Chapter, made one loan of \$100 in 1928-29, and none in 1929-30, and a total of \$278.13 has been repaid.

The Home Economics Self-Government Association made no loans in 1928-29, but \$16.43 was repaid. Two loans were given out in 1929-30 amounting to \$100, but there were no repayments for the year.

Interest on the Edward M. and Effie R. Johnson gift of \$5,000 is used for loans to women students. These loans are administered through the office of the dean of women. For the year 1928-29, 10 students received \$604; and in 1929-30, 18 students received \$928 in loans.

Scholarships.—The following scholarships were awarded during the biennium:

	1928-29	1929-30
Mrs. Elbert L. Carpenter Scholarship.....	\$ 100.00	\$ 100.00
Mrs. George C. Christian Scholarship.....	100.00	100.00
Mrs. George P. Douglas Scholarship.....	100.00	100.00
Faculty Women's Club, Student Section.....	150.00	150.00
P.E.O. Scholarship	100.00	100.00
Nina Morais Cohen Scholarship.....	120.00	120.00
Beta Iota Alpha Scholarship.....		50.00
Mu Phi Epsilon Scholarship.....	50.00	50.00
Sigma Theta Pi Scholarship.....		60.00
George H. Partridge Scholarships.....	500.00	500.00
St. Paul College Club Scholarships.....	750.00	600.00
Women's Self-Government Association Scholarships	1,600.00	1,550.00

Respectfully submitted,

ANNE DUDLEY BLITZ, *Dean*

COUNSELOR FOR WOMEN

It is a pleasure to report on the steady normal development of the vocational counseling work for the year 1929-30.

There was a 27 per cent increase in the total number of interviews as compared with the previous year; more girls being seen both on campus and at the office by special appointment. There were also fewer failures to keep appointments than in any previous year; and many more girls asking for additional interviews as well as many more additional interviews. There was also a great gain in the number of advisees of previous years who came in again for further counseling.

One of the first advisees of the present counselor, seen in 1927, was greatly disturbed at the time because she had not been able to choose a profession. She was doing very good but thought she was almost the

only person who had not made a vocational decision, and was much relieved to be assured her case was not unusual. She has had a talk with the counselor about once a year since that time, and reported a few weeks ago that she had secured a most satisfactory teaching position for next year.

Quite the opposite are cases of seniors who have just realized that they probably will not be able to find work immediately in the professions for which they have trained. It has been the policy of the present counselor not to stress the placement service of the organization which she represents, but this year, because of general employment conditions, a greater effort will be made to help more students during the vacation period. During the school terms the placement service to students is more of an advisory nature, giving them the opportunity of meeting actual situations in applying for work.

Because of the greater number of students assigned this year by Miss Hasselmeyer, the percentage of freshman counseling has increased.

The Vocational Committee of the W.S.G.A. under the chairmanship of Mae Sweet and Irma Kuesel did excellent work in arranging and bringing the vocational talks to the attention of the student body, and the letters written by this group to seniors this spring interested ten more students in the advisory service.

The College Ability Test list furnishes additional information about the type of student who comes for counseling. It indicates that 72 per cent of those whose scores were obtained will not be under a great mental handicap in finishing a full college course.

The follow-up work has been slightly increased, but the development of this important part of the counseling work is always limited by the amount of time that can be devoted to the whole counseling program.

Respectfully submitted,

KATHERINE WOODRUFF,
Vocational Counselor for Women

THE DEAN OF STUDENT AFFAIRS

To the President of the University:

SIR: I herewith submit my report as dean of student affairs for the years 1928-29 and 1929-30.

Foreign students of the University.—Dr. Alfred E. Koenig has continued his volunteer service as special adviser of foreign students. The University and students are greatly indebted to Dr. Koenig for this very helpful service. Following is a summarization of this work:

	Conf. Hours	Students	Diff. Students	Men	Women
1928-29					
Fall Quarter					
September	6	10	7	7	3
October	7	44	40	33	11
November	8	34	18	26	8
December	5	9	..	9	..
	—	—	—	—	—
	26	97	65	75	22
Winter Quarter					
January	7	25	8	18	7
February	6	24	4	21	3
March	7	23	7	21	2
	—	—	—	—	—
	20	72	19	60	12
Spring Quarter					
April	8	24	5	19	5
May	9	32	12	22	10
June	3	8	5	4	4
	—	—	—	—	—
	20	64	22	45	19
Total for year.....	66	*233	106	180	53
Last year	63	271	128	212	59
	—	—	—	—	—
	3	38	24	32	6

* A number of students, not counted, were interviewed at monthly receptions at University Y.M.C.A.

1929-30	Fall Quarter	Winter Quarter
Conference hours observed.....	24	21
Students	98	53
New students	54	19
Men	73	44
Women	25	9

ANALYSIS 1928-29

Country	Students	Men	Women	Mayo
Argentine	1	..	1	..
Armenia	4	4	..	..
Australia	4	3	..	1
Austria	2	2	..	1
Belgian Congo	1	1	..	..
Belgium	3	2	1	2
Bessarabia	1	1	..	..
Brazil	1	1	..	..
Canada	85	58	27	20
China	17	16	1	..
Czechoslovakia	4	2	2	..
Denmark	3	2	1	..
England	5	2	3	1
Finland	5	4	1	..
France	2	1	1	..
Germany	12	9	3	1
Greece	2	2	..	..
Hawaii	3	3	..	..
Holland	3	3	..	1
India	3	3	..	..
Ireland	2	1	1	1
Italy	4	4	..	2
Japan	2	2	..	..
Lithuania	1	1	..	..
Mexico	2	2	..	..
New Zealand	2	2	..	1
Norway	15	12	3	1
Palestine	3	3	..	..
Panama	1	..	1	..
Philippines	26	26	..	..
Poland	10	8	2	..
Roumania	5	3	2	..
Russia	40	31	9	..
Scotland	4	3	1	..
Spain	1	1	..	1
Sweden	14	8	6	1
Ukraine	1	1	..	..
Unclassified	3	2	1	..
Totals, 37 countries.....	297	230	67	34

Student organization finances.—The work of advising and supervising student activity finances was last year under Mr. Hostrup who succeeded Mr. Fraine, this year under Mr. Eriksen. All of these men have been members of the accounting department of the School of Business Administration. The portion of their time given to this work has been paid for by the activities served. Following is a brief summary of Mr. Eriksen's report for the year to date.

Each year more student activities need and are given financial advice as to the handling of their funds. This year close to \$120,000 of income receipts taken in by different organizations was audited. Student organizations such as the *Daily* with \$40,000, the *Gopher* with \$20,000, the *Ski-U-*

Mah with \$10,000 and some of the dances with expenditures of around \$3,000 have been carefully checked as to their expenditures. Most students holding these financial positions are inexperienced and because of this inexperience, their organizations have in the past suffered serious losses. This advice and guidance results in direct valuable training and experience to the individual as well as successful and healthy development of the organization. The auditor offers a short course in the fall for activity business managers. Fraternity treasurers are invited to avail themselves of this opportunity. Standard forms have been devised so that each organization will make a report on forms which may be used from year to year for comparative purposes.

Of the publications, the *Daily*, the *Gopher*, and the *Ski-U-Mah* are clear of debt. The *Daily* has a good reserve built up. The other two are doing well to be clear of indebtedness. Of the minor college publications, all of them with the exception of the *Law Review* and the *Quarterly* have been struggling for existence, the *Gopher Countryman*, the *Gopher Business News*, and the *Mentor* finishing each year slightly in debt.

The *Mentor* and the *Gopher Business News* have this year gone on a quarterly basis and present indications are that on that basis there will be a sufficient demand to support them. The *Gopher Countryman* is considering one or two plans for reorganization either of which will, I believe, result in a sound financial situation.

Of the dramatic groups, the *Masquers* is just completing its most successful year. It will close the year clear of debt and with a balance in the bank. The *Arabs* have not as yet received sufficient support to justify their existence. This is also true of the *Garrick Club*.

The all-university class organizations are at present clear of debt. Complaint of fraternity indebtedness has been more frequent this year than for some years. These complaints have been of men's groups entirely—both professional and social. These groups present a difficult problem from the standpoint of finances as they do not seek advice, and our first intimation of difficulty comes from creditors, only after the situation has become serious.

Student councils.—The All-University Student Council has been active in supervision of student elections and through committees, the carrying on of Homecoming and assisting in Freshman Week with, I believe, good results. Beyond this there has been no outstanding activity. College councils other than those of Law, Agriculture, and Nursing have been inactive.

Publications.—The *Daily* as stated above has been successful financially. At the present time, the Student Board of Publications has asked that a general student vote be taken to find whether the students wish *Ski-U-Mah* continued or not. There has been much dissatisfaction with their quality of humor and tone of many of their articles. The *Gopher* has maintained its past record of excellence editorially but is in a critical situation financially due to an apparent lack of interest and support by the student body. All of the college publications are successful from the editorial standpoint.

Fraternities.—There has been no decided change in the general fraternity situation. There has been some increase in the calls on this office by merchants for assistance in collecting fraternity bills. Two or three chapters are apparently facing serious financial difficulties. On the whole, the general situation is a healthy one. The one factor which gives the greatest information as to the healthful condition of a chapter is the scholastic condition. Attached is a compilation of the scholastic standing of each chapter for the year 1928-29.

SCHOLASTIC COMPARISON

ACADEMIC FRATERNITIES, 1928-29

Phi Delta Theta.....	1.371	Chi Psi	1.028
Acacia	1.273	Alpha Phi Alpha.....	1.008
Omega Psi Phi.....	1.265	Beta Theta Pi.....	.999
Lambda Chi Alpha.....	1.219	*Tau Delta Phi.....	.994
Alpha Delta Phi.....	1.199	Delta Tau Delta.....	.977
Phi Epsilon Pi.....	1.170	Sigma Alpha Epsilon.....	.976
Phi Gamma Delta.....	1.155	Delta Chi .....	.975
Sigma Alpha Mu.....	1.134	Phi Sigma Kappa .....	.969
Delta Kappa Epsilon.....	1.120	Zeta Psi .....	.940
Tau Kappa Epsilon.....	1.104	Pi Kappa Alpha.....	.926
Psi Upsilon	1.683	Phi Kappa Sigma.....	.924
Alpha Tau Omega.....	1.077	Kappa Sigma .....	.917
Sigma Chi	1.074	Theta Xi .....	.899
Sigma Nu	1.073	Delta Upsilon .....	.871
Theta Kappa Nu.....	1.070	Phi Kappa Psi.....	.855
Alpha Sigma Phi.....	1.068	Phi Beta Delta.....	.840
Theta Delta Chi.....	1.057	Kappa Alpha Psi.....	.714
Chi Phi	1.050	Fraternity average	1.039
Sigma Phi Epsilon.....	1.038	General average of all students..	1.177
Theta Chi	1.031		

* Winter and spring records, 1927-28.

ACADEMIC SORORITIES, 1928-29

Alpha Kappa Alpha	1.981	Zeta Tau Alpha.....	1.370
Phi Delta Sigma.....	1.747	Delta Gamma	1.316
Beta Iota Alpha.....	1.635	Kappa Alpha Theta.....	1.308
Alpha Gamma Delta.....	1.451	Alpha Omicron Pi.....	1.297
Phi Omega Pi.....	1.442	Delta Zeta	1.276
Pi Beta Phi.....	1.437	Phi Mu	1.263
Delta Delta Delta.....	1.418	Chi Omega	1.238
Kappa Delta	1.414	Alpha Phi	1.234
Alpha Xi Delta.....	1.403	Alpha Chi Omega	1.216
Beta Phi Alpha.....	1.395	Kappa Kappa Gamma.....	1.175
Sigma Kappa	1.386	Alpha Delta Pi.....	1.088
Gamma Phi Beta.....	1.3808	Sorority average	1.344
Sigma Delta Tau.....	1.3804	General average of all students..	1.177

PROFESSIONAL FRATERNITIES, 1928-29

<i>Agriculture and Forestry</i>		<i>Law</i>	
Alpha Gamma Rho.....	1.426	Phi Delta Phi.....	1.444
Tau Phi Delta.....	1.317	Gamma Eta Gamma.....	1.114
<i>Business</i>		Phi Alpha Delta.....	1.079
Alpha Kappa Psi.....	1.153	Delta Theta Phi.....	1.041
Delta Sigma Pi.....	1.149	<i>Medicine</i>	
<i>Chemistry</i>		Nu Sigma Nu.....	1.638
Alpha Chi Sigma.....	1.634	Phi Delta Epsilon.....	1.604
<i>Dentistry</i>		Phi Beta Pi.....	1.486
Delta Sigma Delta.....	1.409	Omega Upsilon Phi.....	1.398
Xi Psi Phi.....	1.264	Phi Chi.....	1.340
Psi Omega.....	1.034	Phi Rho Sigma.....	1.265
Alpha Omega.....	.871	Alpha Kappa Kappa.....	1.164
<i>Engineering</i>		<i>Mines</i>	
Sigma Alpha Sigma.....	1.852	Sigma Gamma Epsilon.....	1.688
Theta Tau.....	1.451	Sigma Rho.....	1.386
Scarab.....	1.359	<i>Music</i>	
Triangle.....	1.330	Phi Mu Alpha.....	1.697
Kappa Eta Kappa.....	1.028	<i>Pharmacy</i>	
Alpha Rho Chi.....	.909	Kappa Psi.....	1.408
<i>Journalism</i>		Phi Delta Chi.....	1.129
Sigma Delta Chi.....	1.472	Alpha Beta Phi.....	.094
General average professional fraternities.....		1.291	
General average of all students.....		1.177	

PROFESSIONAL SORORITIES, 1928-29

<i>Architecture</i>		<i>Medicine</i>	
Alpha Alpha Gamma.....	1.445	Alpha Epsilon Iota.....	1.446
<i>Chemistry</i>		Alpha Delta Tau.....	1.258
Pi Delta Nu.....	1.966	<i>Music</i>	
<i>Forensic</i>		Sigma Alpha Iota.....	1.923
Kappa Rho.....	1.710	<i>Dental Nursing</i>	
Zeta Alpha Psi.....	1.498	Alpha Kappa Gamma.....	1.005
<i>Journalism</i>		<i>Pharmacy</i>	
Theta Sigma Phi.....	1.741	Kappa Epsilon.....	1.625
Professional sorority average.....		1.561	
General average of all students.....		1.177	

NON-FRATERNITY, 1928-29

<i>Men</i>	
Science, Literature, and the Arts.....	1.046
Agriculture, Forestry, and Home Economics.....	1.280
Business Administration.....	1.325
Chemistry.....	.939
Dentistry.....	1.101
Education.....	1.291
Engineering and Architecture.....	.797
Law.....	1.207
Medicine.....	1.289
Mines and Metallurgy.....	1.191
Pharmacy.....	1.198

THE PRESIDENT'S REPORT

NON-SORORITY, 1928-29

Women

Science, Literature, and the Arts.....	1.237
Agriculture, Forestry, and Home Economics.....	1.184
Business Administration	1.510
Chemistry .....	.545
Dentistry	1.139
Education	1.410
Engineering and Architecture.....	1.018
Law	1.342
Medicine	1.166
Nursing	1.467
Dental Hygienists .....	.976
Nursing, Public Health.....	1.455
Pharmacy	1.525

Father's and Mother's Days.—This past fall a change was made in the procedure. The fathers were invited to bring with them to the dinner their sons and daughters. As a result, it was a difficult matter to accommodate them in the Minnesota Union.

This spring for Mother's Day a number of changes were made. Mothers were asked to bring sons and daughters. In anticipation of the large number, the dinner was arranged for in the Armory. The play put on for them by the students in the afternoon was given in the Northrop Memorial Auditorium enabling all to see it. A reception to meet the president and the deans was held in the foyer immediately following the play. At the dinner held in the Armory the president of the University was the only speaker. These days have been very successful in bringing parents from widely distributed areas of the state and the Northwest. They cannot help but create a mutual feeling of understanding and friendship.

Following is a summary of a report submitted by Assistant Dean McCreey covering his program of work for the past year. It divides into the following divisions:

1. *Freshman personnel.*—A letter was sent before registration to each prospective male registrant welcoming him and asking him to come to the office and get acquainted. Many came in at once; many others through the year; all of them usually referring to the invitation contained in the letter. The general subjects covered in these conferences are life work, arrangement of study schedules, how to take notes, emotional difficulties, extra-curricular participation, choice of course work, and choice of fraternity, and personal habits.

2. *Interfraternity Council.*—As chairman of the Interfraternity Council, I am trying to develop a definite plan for the constructive training of freshman pledges, for the improvement of fraternity scholarship, through the fixing of a scholastic standard for initiation and the organization and carrying on of a co-operative buying association among the fraternities. The development of this last may be briefly shown by following financial statement:

MINNESOTA CO-OPERATIVE BUYERS' ASSOCIATION, INC.

Financial Statement

ASSETS		LIABILITIES	
Bank balances	\$ 505.18	Total accounts payable.....	\$8,010.57
Note on hand.....	1,300.00	Total stock outstanding.....	950.00
Cash on hand.....	765.49		
Rebate on coal.....	119.02	Total liabilities	\$8,960.57
Accounts receivable	7,152.04		
Fixed assets	678.00		
Total assets	\$10,519.73		
Total liabilities	8,960.57		
Net worth	\$ 1,559.16		

3. *Householders' Association.*—An effort is being made to raise the standards of rooming houses and to better conditions; to obtain a closer co-operation and understanding between the householder and the University. The group meets once a month for discussion of all of the problems relating to the care of men roomers. There are at present one hundred twenty-five members out of about four hundred householders who take men student roomers.

4. *Tutoring Bureau.*—This work is a definite phase of the senior advisory work for men. It is a part of the general tutoring work for men and women and is to supplement the work which has been successfully carried on for some years by W.S.G.A. for women students. Following is a brief summary of the work for the past fall and winter quarters:

SENIOR ADVISER BUREAU

University of Minnesota Tutoring Bureau

	Men Tutored	Tutors Used	Earnings of Tutors*	Rooming House Contacts	Miscel. Contacts
Fall	54	43	\$162.00	33	10
Winter	63	50	189.00	0	4

* Estimated on the basis of 5 hours tutoring to the student at the regular rate of \$.60 per hour.

The Senior Adviser Bureau has kept office hours during the past two quarters averaging 5 hours per day. The bureau employs the services of nine students who give their time gratis.

The students applying for tutoring at the bureau may be classified under the following general heads:

1. Freshmen unaccustomed to university teaching procedure and requirements.
2. Freshmen with insufficient or blurred background for a particular course.
3. Students who for various reasons find themselves unprepared to take final examinations.
4. Students of slow mentality.

The miscellaneous cases have been students interviewed and referred to other departments.

The future of the Tutoring Bureau looks favorable. In the short time that it has been in existence a decided need for the bureau has presented itself. The fact that most of the students applying have wanted help in the subjects of freshman chemistry, mathematics, and physics shows that there is still a large percentage of the students who are not aware of the bureau's existence. The ratio of students aided by the bureau to the number of students failing or receiving low grades is small indeed when the total university registration is taken into consideration. I feel that with more publicity and a greater feeling of confidence in the Tutoring Bureau by the instructors, an important scholastic need of the University will be served.

Thirty-three rooming houses were partially organized in the fall quarter. The essence of the plan being that under organization the men student roomers who were not naturally active—i.e., were passive in their university life—would obtain a chance for mutual scholastic, athletic, and social adjustment. The project has been discontinued for the present because of the size of the task in the face of apparent disinterest of those students for whom the plan was initiated. The future of the task lies in the formulating of some tangible basis on which to present the plan to the students.

The general situation in regard to military drill attendance has improved materially as the following figures show. In 1925-26 thirty-two (32) students were dropped by this office for delinquency in military drill. In 1926-27 thirty-seven (37) were dropped; in 1927-28 twenty (20); in 1928-29 twenty-one (21); and during 1929-30 only eight (8) were dropped.

During the year 1929-30 a total of \$38,132 was loaned to 290 students from the general university funds through this office. From the special funds in this office a total of \$9,362.50 was loaned to 165 students making a grand total of \$47,494.50 loaned to 455 students. The amounts of individual loans ranged from \$3 to \$250.

In addition to this, loans amounting to \$3,006.50 were made to 65 students through the office of the dean of women.

Respectfully submitted,

EDWARD E. NICHOLSON,
Dean of Student Affairs

THE UNIVERSITY HEALTH SERVICE

To the President of the University:

SIR: I have the honor to submit herewith the report of the activities of the Students' Health Service during the academic years 1928-29 and 1929-30.

GENERAL STATEMENT

This period covers the last year that the Students' Health Service occupied its original quarters on the first floor of Pillsbury Hall and its first year in the new Health Service Building. During the year 1928-29, due to the limited quarters in Pillsbury Hall, the activities of the Health Service were substantially the same as during the previous years. Since moving into the new building, however, the use which students have made of the department has increased very materially. This increase has affected every phase of the Health Service activities but the increases have been most marked in periodic health examinations, entrance examination re-checks, voluntary calls at the out-patient dispensary for medical advice and treatment, laboratory service, X-rays, and hospitalization. The new quarters, because of their completeness, suitability, and attractiveness, have not only made possible their greater service to the student body, but actually have stimulated students to greater voluntary use of the facilities available.

Since its establishment eleven years ago, the Students' Health Service has been rendering service to students, developing the various phases of the work, and establishing policies for future guidance. These years probably should be considered as the formative years of the department because each year until the present, it seems that there were some phases of a comprehensive program which were lacking. In the future there will be much opportunity for making various phases of the service more efficient and more far reaching, but at present it seems that the essentials of a satisfactory health service are being supplied.

The purpose of the service is to promote the general health and physical welfare of the students by reducing to a minimum their illnesses and physical disabilities, by providing adequate medical and hospital care for such illnesses as they develop, by discovering physical defects and assisting in the correction of them, and by familiarizing students through actual demonstration, with a practical program of health conservation and disease prevention.

The service which is rendered to students by the Health Service staff comprises the following aspects: a complete examination of every student at the time of matriculation in the University; a personal conference during the fall quarter with each of the students who receives an examination upon entrance—this conference is for the purpose of individualizing the entrance examination and rechecking or following up abnormalities which were noted at that time; a dental examination as part of the entrance physical examination and at such subsequent periods as students may

desire; health examinations of all seniors and annually for students in certain of the professional schools; assignment to physical activities and adjustment of scholastic programs in accordance with students' physical capacities; certification as to physical fitness for all students who wish to compete in intercollegiate athletics; medical service at any hour of the day or night; preventive vaccinations and inoculations at specified times; hospitalization for students who need bed care; emergency service of all kinds, and consultations in regard to personal and emotional problems, worries, etc. with a psychiatrist who is devoting his full time to this work. In addition to this personal service to students, all food handlers at the University cafeteria are examined by the Students' Health Service in order to be certain that they are not infected with disease that may be transmitted to others; the water of the swimming pools is analyzed frequently, and the general sanitation of the campus is supervised.

PROFESSIONAL STAFF

As the scope and volume of the work of the Health Service has increased, the staff has been enlarged and strengthened, until during the past year it consisted of 38 physicians, 9 dentists, 6 nurses, 1 X-ray technician and physiotherapist, 1 laboratory technician, 2 dental assistants, 2 dental hygienists, 1 business manager, 1 cashier, 2 stenographers, and 5 clerks. Of the physicians, 8 devoted their entire time to the Health Service and the Department of Preventive Medicine and Public Health, and the other 30, for the most part specialists in the various phases of medical practice, devoted part of their time to the Health Service and part to private practice. The total hours spent in the Health Service work by these full time and part time physicians would be equivalent to the full time of approximately 15 physicians. The group of physicians on part time was made up largely of specialists in internal medicine, surgery, orthopedics, genitourinary diseases, dermatology, diseases of the chest, diseases of the eye, ear, nose, and throat, mental and nervous diseases, physiotherapy, gynecology, corrective exercises, and gymnastics. All of the dentists devoted about half time to the Health Service and about half time to private practice. The full time professional staff consists of physicians, two of whom are women, trained in general medicine and specializing in preventive medicine and public health, and a psychiatrist who devotes his entire time to mental hygiene consultations with students.

HEALTH INSTRUCTION

Altho the medical care of sick students and the correction of certain physical defects is a vitally important part of the Health Service's activities, undoubtedly the greatest value of the work of this department is educational, in that it teaches students to correct physical defects, to obtain periodic health examinations, to live hygienically, to appreciate competent medical attention and to seek it promptly when they become ill.

MEDICAL SERVICE

The services of physicians and nurses are available to students at all times at the Students' Health Service dispensary and hospital. Through these institutions the Health Service provides for students whatever medical advice and care is necessary, altho for major illnesses or prolonged medical attention students are encouraged to obtain the services of private practitioners. Members of the Health Service staff also will make calls upon students at their rooms when necessary, but for continued bed care by the Health Service students are required to enter the students' hospital.

HEALTH SERVICE CLINICS

Medical out-patient departments or clinics exclusively for students are located on the main campus, the agricultural campus, at Morris, and at Crookston. On the main campus one or more physicians are in attendance to see students at all hours of the day; on the agricultural campus a physician is in attendance several hours each day; while at the Crookston and Morris substations a nurse is in attendance at all times, and physicians are called when necessary. In these out-patient clinics medical examinations are performed, clinical laboratory work is done, treatments and advice are given, and prescriptions filled.

The work of these medical out-patient departments is most important in our attempt to prevent diseases among the student body; for when students come to us upon the first appearance of symptoms, the possibilities

TABLE I. VISITS TO THE HEALTH SERVICE (MAIN CAMPUS) FOR MEDICAL ATTENTION*†

Year	Number of Visits	Average Visits per Student of Collegiate University Grade
1918-19.....	8,167	1.42
1919-20.....	12,179	2.01
1920-21.....	15,975	2.51
1921-22.....	16,921	2.47
1922-23.....	20,406	2.74
1923-24.....	23,106‡	2.96
1924-25.....	23,762‡	2.95
1925-26.....	24,036	2.78
1926-27.....	24,333	2.22
1927-28.....	26,676	2.82
1928-29.....	26,668	2.71
1929-30.....	31,656	3.08

* In this tabulation the attendance at the out-patient clinics at the agricultural substations has not been included, because these groups are so greatly affected by periodic epidemics, that for purposes of comparison they are not nearly so satisfactory as the group which is served by the Health Service on the main campus. The summer session figures also have been omitted for obvious reasons.

† These totals do not include visits for physical examinations, dentistry, hospitalization, excuses for illness, contagious inspection, eye refractions, vaccinations, immunity tests, physiotherapy, laboratory, or X-ray services.

‡ Exclusive of chlorine treatment and smallpox vaccinations dressed during period of smallpox epidemic.

of preventing the development of serious illnesses as well as of restricting the spread of communicable diseases are greatly increased. The increasing use that students voluntarily are making of this service from year to year is shown in Table I.

As will be seen from the tabulation, the annual "visit" rate varied but little from 1922-23 until 1929-30. With this past year, however, a definite increase in the attendance rate of students is noted. Since this is the first year of occupancy of the new quarters, it seems quite evident that the

TABLE II. TOTAL SERVICES RENDERED
A. During the Year 1928-29 (Summer Quarter Included)

Physical Examinations	Main Campus	Agricultural Campus	Crookston	Morris	Total
Entrance	4,043	273	304	167	4,787
Periodic health	1,460	....	....	....	1,460
Special	570	51	....	302	923
Total	6,073	324	304	469	7,170
Dispensary visits					
Medical attention ...	29,240	4,114	443	2,064	35,961
Contagious inspection.	182	513	47	1,328	2,070
Eye refractions	933	....	....	....	933
Excuses only	3,891	451	258	205	4,805
Vaccinations, immunity	2,466	114	105	253	2,938
Tests, etc.* .....	....	....	....	....	....
Total	36,712	5,192	853	4,850	46,707
Physiotherapy	918	....	....	....	918
Dental services:					
Examinations†	3,894‡	....	....	....	3,894
Prophylactic treatments	1,630‡	....	....	....	1,630
Extraction and surgery	519‡	....	....	....	519
Other services	5,184‡	....	....	....	5,184
Total	11,227	....	....	....	11,227
Laboratory services and examinations†					
X-rays	9,675	226	6	25	9,932
House calls	2,708	....	1	....	2,709
Infirmary and hospital cases	479	23	....	....	502
Operations	750	269	155	223	1,397
Operations	139	‡	1	....	140
Total services	68,671	5,034	1,420	4,567	80,692
Days lost on account of illness	9,806	....	....	....	....

* Figures do not include 2,140 smallpox vaccinations, 3,956 Schick tests, 4,686 Von Pirquet tests performed as part of the entrance and periodic health examinations.

† Figures do not include dental and laboratory examinations performed as part of the entrance and periodic health examinations.

‡ For these services students were referred to the main campus and are included in the services rendered there.

B. During the Year 1929-30 (Summer Quarter Included)

Physical Examinations	Main Campus	Agricultural Campus	Crookston	Morris	Total
Entrance	4,402	345	28	186	4,961
Recheck on entrance....	3,088	....	....	....	3,088
Periodic health	2,626	....	....	....	2,626
Special	634	87	....	6	727
Total	10,750	432	28	192	11,402
Dispensary visits					
Medical attention	33,572	4,237	993	931	39,733
Contagious inspection..	364	1,060	26	484	1,934
Eye refractions	1,028	....	1	....	1,029
Excuses only	581	281	112	209	1,183
Vaccinations, immunity tests, etc.§	1,885	247	71	100	2,303
Total	37,430	5,825	1,203	1,724	46,182
Physiotherapy	1,764	....	....	2	1,766
Dental services:					
Examinations†	2,710†	159	....	....	2,869
Prophylactic treatments	1,626†	....	....	....	1,626
Extraction and surgery	414†	....	....	....	414
Other services	5,436†	....	....	....	5,436
Total	10,186	159	....	....	10,345
Laboratory services and examinations†					
X-rays	13,442	183	1	....	13,626
House calls	3,790	....	1	3	3,794
Infirmary and hospital cases	291	18	....	....	309
Operations	880	96	77	156	1,209
Days lost on account of illness	120	....	2	1	123
Total services	78,653	6,713	1,312	2,078	88,756
Days lost on account of illness	8,788	....	....	....	....

§ Figures do not include 2,410 smallpox vaccinations, 4,061 Schick tests, and 6,051 Mantoux tests performed as part of entrance and periodic health examinations.

better facilities and the greater attractiveness of the quarters have more than compensated for the fact that the new Health Service Building is less centrally located on the campus than was the old one.

The different types of services rendered to students at the out-patient departments of the Health Service during the years 1928-29 and 1929-30 are shown in Table II.

As will be seen by comparison of Section A and Section B of the table, the increase of services rendered during the year 1929-30 occurred only on the main campus where new quarters were provided. A comparison of the various types of services rendered during these two years

shows that the greatest increases were in health examinations, dispensary visits, laboratory examinations, and hospital cases.

STUDENT INFIRMARIES OR HOSPITALS

Infirmaries, or hospitals, for the care of students are maintained in close connection with the out-patient clinics or dispensaries. This arrangement seems essential for the efficient operation of a Students' Health Service; for when a student who should go to bed is seen in the clinic, it should be easy to put him there. Early hospitalization minimizes the danger of communicable diseases spreading throughout the university community and frequently prevents the development in the individual of serious complications from relatively insignificant primary infections. In order that early hospitalization may always be practiced, there is a standing rule that all students who have a fever of 100° F. or more shall be put to bed. If these students live in Minneapolis or St. Paul, they usually wish to go home, but if they reside in dormitories or rooming houses, they are admitted to the students' infirmary.

Table III shows the number of student patients hospitalized during each of the past two academic years:

TABLE III. STUDENT HOSPITAL PATIENTS

Hospital	Boys		Girls		Total		Hospital Days	
	1928-29	1929-30	1928-29	1929-30	1928-29	1929-30	1928-29	1929-30
Main campus	522	515	228	365	750	880	2,634	4,426
Agricultural campus	205	76	64	20	269	96	1,366	384
Crookston	105	53	50	24	155	87	640	336
Morris	134	100	89	56	223	156	831	554
Total	966	744	431	465	1,397	1,209	5,471	5,700

The marked decrease during 1929-30 in the number of students hospitalized at the several agricultural schools is evidence that during the year serious illnesses were not prevalent. In spite of this, however, there was a decided increase in the number of patients hospitalized on the main campus. This was due to the better hospital facilities now available.

Table IV shows the number of student patients hospitalized by the Health Service on the main campus each year since the department was organized. The number of patients hospitalized during the year 1930 probably represents the minimum that may be expected in the future, because this year there were no epidemics of communicable diseases to increase the amount of illness, and during the year students were just becoming acquainted with the Health Service in its new location.

The large number of students given hospital care as compared with other non-epidemic years shows the use which students are already making of the fine facilities now available.

TABLE IV. HOSPITAL PATIENTS OF COLLEGIATE GRADE ON MAIN CAMPUS

Year	Number of Patients	Rate per 1000 Students Registered	Rate per 1000 Out-Patients Clinic Visits	Comments
1921-22	684	99.9	40.42	Measles epidemic
1922-23	861	115.7	42.19	Influenza epidemic
1923-24	736	96.0	31.85	Moderate influenza epidemic
1924-25	560	69.6	23.57	Smallpox epidemic
1925-26	675	78.3	28.08	Some scarlet fever
1926-27	583	63.8	23.96	No epidemic
1927-28	650	68.6	24.37	Moderate epidemic of mild influenza
1928-29	750	76.3	28.12	Extensive epidemic of mild influenza
1929-30	880	85.6	27.80	No epidemic

PHYSICAL EXAMINATIONS

Entrance physical examinations.—To every student who enters the University, the Health Service gives a complete, thoro physical examination. These examinations are conducted during the week prior to the beginning of classes in the fall, and are performed according to the unit system; that is, the student passes from one examiner to another. In September, 1929, there were 2,155 boys and 1,500 girls examined in this manner by the Health Service.

Beginning with the week following the opening of school these students are recalled one by one for the second part of the entrance examination. This consists of a conference with one physician and a recheck or follow-up examination of any abnormalities which were noted. During this conference the physician explains to the student the significance of the findings of the examination and gives advice in regard to the correction of physical defects or of unhygienic habits of living.

Special physical examinations.—These special physical examinations are required of all candidates for athletic teams, members of the Reserve Officers Training Corps, residents of the Home Economic practice teaching houses, etc.

Periodic health examinations.—These examinations, which are individual physical examinations and health conferences, originally were offered only to seniors, but now are available to any student in the University, and have been voted compulsory for all students in several of the professional schools. These examinations are unquestionably one of the most valuable services which the department is rendering. Their value is due in part to the physical defects and diseases discovered, but doubtless the greatest returns will accrue from the educational aspects of the examinations and health conferences. The great increase in the number of these examinations during the year 1929-30 was made possible by the greater facilities available in the new quarters.

PREDOMINANT DISEASES AMONG STUDENTS

During the years 1928-29 there was one disease which attained epidemic proportions throughout the general University. This was influenza, rather mild in character but nation-wide in scope. Many schools and colleges throughout the country were closed temporarily on account of it. In our University we had on the Minneapolis and St. Paul campuses 712 cases. Of these, 211 were hospitalized by the Health Service. To take care of this number it was necessary not only to utilize all our existing facilities at the Health Service, but also to set up an emergency hospital in the ballroom of the Minnesota Union. With this additional space it was possible to admit all students who needed hospital care. Fortunately, serious complications were infrequent, and there were no fatalities among the students cared for by the Health Service. Of scarlet fever, measles, and mumps, there were a few cases, but except for a small epidemic of measles among the students of the School of Agriculture, none of these diseases even threatened to become epidemic. Eleven cases of acute rheumatic fever, almost sufficient to be called a small epidemic, occurred among students, mostly from the School of Agriculture, during a period of several weeks at the end of the winter and beginning of the spring quarter. Thirty-nine operations, mostly appendectomies were performed at the University Hospital, and 95 nose and throat operations were performed at the Health Service. The year 1928-29 was the first in the history of the Health Service during which there were no fatalities among student patients.

The year 1929-30 passed without an epidemic of any sort, except the acute respiratory infections or colds which become prevalent every winter. At the beginning of the fall quarter there were twelve cases of scarlet fever among the students at the School of Agriculture, but by the application of strict control measures the spread of the disease was stopped before the infection became general throughout the school. During the year there were also a few cases of mumps, chicken-pox, and pneumonia, but there was no spread of any of these diseases among the student body. The more serious cases cared for in the students' hospital were tuberculosis, 6 cases; pleurisy with effusion, 3; carcinoma, 2; mastoiditis, 7; with mastoidectomy, 4; appendicitis, acute, 35; with appendectomy, 22; fractures, 11; infections, 51; acute upper respiratory infections, 154; tonsillectomies, 62; etc. During the year one student died as the result of a perforated carcinoma of the colon.

MENTAL HYGIENE

Altho a certain amount of mental hygiene work has been carried on in the Students' Health Service for approximately eight years, it has been only during the past two and a half years that we have had a psychiatrist devoting his full time to this work. Dr. deBerry's report for the academic years 1928-29 and 1929-30 is as follows:

During this period 391 students were referred to the mental hygiene department from the following sources: 160 from Students' Health Service physicians; 122 came voluntarily; 29 referred by the faculty; 20 by deans or administrative officers; 7 by

other students; 5 by social agencies; 4 by private physicians; 3 by parents; 1 by the President's office; 2 by probation officer; and 38 by miscellaneous sources.

One thousand sixty-five (1,065) interview hours were divided among these students as follows: 118 were interviewed 1 hour each; 97 for 2 hours each; 43 for 3 hours each; 21 for 4 hours; 11 for 5 hours; 6 for 6 hours; 7 for 7 hours; 7 for 8 hours; 3 for 9 hours; 5 for 10 hours; 2 for 11 hours; 1 for 13 hours; 1 for 14 hours; 4 for 16 hours; 2 for 17 hours; and 1 each for 18, 19, 25, 33, and 34 hours.

The rather disproportionate number of students who were seen only once is due in large measure to the increased amount of consultation work with the various members of the staff of the Health Service. Altho these cases are usually not serious enough to require any prolonged study, the work is probably very valuable from the educational standpoint. In addition to the above cases, there were carried over from the previous year about 50 old cases which required prolonged and intensive treatment.

It is extremely difficult to make any classification of the problems handled in this department. They range through every phase from acute, violent psychoses to minor problems of vocational adjustment. These latter may require only one interview. The bulk of the work lies somewhere between the two extremes. These patients are not disturbed enough to be sent to hospitals, and usually can be kept in the University. Their emotional problems, however, are often severe enough to interfere seriously with the efficiency of school work and happiness in contacts with other students. Unhealthy family situations, poor social adjustment in college, scholastic problems resulting from inadequate preparatory work and occasionally poor intellectual endowment, sex conflicts, problems arising from excessive extra-curricular activities, vocational guidance, emotional disturbances arising from physical defects make up the bulk of the work.

Some universities which have attempted to provide mental hygiene service for students have experienced great difficulty in making contact with the students who need such counsel. At Minnesota no such difficulty has been experienced; in fact, the psychiatrist's chief problem has been to find sufficient time to take care of the students who desire appointments with him. It is possible that some later expansion of this service may be necessary.

DENTAL DEPARTMENT

The dental department of the Health Service, which was established some years ago, to provide dental service to students on a cost basis has continued to fulfill the purpose for which it was intended. During the past two years a slightly larger number of students have made use of this service than ever before, but the policy of the department has been to provide dental care for students who would not otherwise obtain this service, rather than to embark upon an ambitious program of development. Our very efficient dental staff has been continued and the financial returns have been sufficient to cover all expenses.

HEALTH SERVICE BUILDING

The Health Service Building which was occupied by the department during the year 1929-30 is proving most satisfactory. It is comfortable and attractive in its arrangement and equipment, and at the same time is so planned as to make the rendering of efficient medical service easy. Certain services have been utilized co-operatively by the Health Service, the University Hospital, and Out-patient Department, and the arrangement

in each case has been mutually beneficial. There was some question in the minds of many as to whether the location of the new Health Service, which is farther from the center of the academic campus than the old one was, would not decrease the use which students would make of the service. This report, however, shows that we need have no fears in this regard. The unexpectedly large increase in demands which has been made upon the service has presented certain problems during the current year, but in the future such increases can be anticipated, and provisions made in advance to care for them.

Respectfully submitted,

H. S. DIEHL, *Director.*

THE UNIVERSITY LIBRARY

To the President of the University:

SIR: I submit herewith a summary report of the University Library for the biennium ending June 30, 1930.

The general characteristics of both years covered by the report have been the steady growth of the library and a general increase in use. During the past two years, 74,420 volumes (37,577 in 1928-29 and 35,843 in 1929-30) have been added to the general library, and the libraries of Agriculture, Law, and the University High School. The total number of recorded volumes in the General Library and the three branches mentioned was 609,332 on June 30, 1930. This is a larger number than has ever before been added in a similar period. Of these, 10,161 volumes were gifts or exchanges. The most noticeable additions have been in the field of periodicals and serials and in very notable additions of session laws in the Law library. Other important additions were the purchase in 1929 of about 6,000 volumes of Scandinavian publications (mostly Norwegian) which formed the library of the Norwegian Booksellers Association, and the private collection on apiculture belonging to the Reverend Francis Jager. The latter was added to the library of the Department of Agriculture.

The addition of modern machinery in the bindery has raised the output from 7,173 volumes in 1927-28 to 9,284 in 1928-29, and 10,157 in 1929-30, with no additions to the staff.

The large number of volumes on open shelves and the varied conditions of use in the different branches makes circulation statistics a very imperfect indication of the library use. Nevertheless, the general increase in use is indicated by the increase from 688,052 volumes circulated in 1928-29 to 720,044 in 1929-30. The summer session circulation has doubled from 56,642 in 1923 to 109,282 in 1929. The use of reserve books has lessened in spite of the increased number of books put "on reserve." A careful study of the whole question of assigned reading, one of the most unsatisfactory and costly of our services, should be made. A renewed interest in assisting the library in securing an adequate number of much used titles in large classes has improved the reserve service to a considerable extent.

The number of books borrowed on interlibrary loan has diminished, while the number lent has increased. This is double evidence of the increasing strength of our own collection.

The catalog department has made excellent progress but has been unable to keep pace with the demands made on it. This is not surprising in face of the fact that it is one of the smallest of its kind in any American university library of similar size and standing.

The reports of the departmental libraries show healthy growth in use and in a gradually increasing attitude of co-operation. Altho necessarily scattered in location we are measurably approaching the desired goal of unified library service in all branches of the library wherever located.

On the debit side may be mentioned the increasing amount of unfinished work which is accumulating in practically every department and the new lines of service which cannot even be undertaken because of lack of help. A large part of this is due to actual increase of material handled and demands for new or more difficult service. A considerable part is due to carelessness or selfishness on the part of the users of the library. Violation of lending rules causes extra record work and prevents others from getting books which should be available. Incomplete and inaccurate order slips greatly delay the receipt of books and handicap service generally. The cost of interlibrary loan service is greatly increased by similar inaccuracies. It seems probable that at least a quarter of our routine expense could be saved if the accuracy and civic consideration which a university education is supposed to promote could be more generally exercised by the users of the library. The elementary courses in the use of libraries have helped considerably with the rather small number of students registered in them. Conditions here are, on the average, no worse, and are probably better, than in other universities. It would be of great economic as well as educational value if enlightened self-interest on the part of the library public could point the way to more careful self-help in using the library service.

An outstanding feature of the year was the creation of a Trust Fund through a bequest of Mr. Herschell V. Jones, late of the *Minneapolis Journal*. The income of this sum which amounts to \$25,000 is to be devoted to the purchase of newspaper files of historic and other interest, and to books of reference in journalism and the history of printing. Not only is this particularly welcome as the first considerable bequest to the library, but Mr. Jones' wide interest and the range of the gift already presented to the library will make it possible to use this income as a nucleus for a collection of permanent value to anyone interested in any phase of printing.

A more detailed manuscript report, for administrative purposes, including departmental reports and reports from the schools and stations outside the Minneapolis and St. Paul campuses, is in preparation. All statistics not of general interest have been relegated to that report.

Respectfully submitted,

FRANK K. WALTER, *University Librarian*

THE GEOLOGICAL SURVEY

To the President of the University:

SIR: I herewith submit a report on the work of the Minnesota Geological Survey during the period from July 1, 1928, to July 1, 1930.

The survey was allotted the sum of \$16,000 for the biennium begun July 1, 1929. A portion of this was set aside for the publication of maps and reports and the remainder was used chiefly in support of the field work connected with the projects outlined in the earlier reports to the president of the University, and as published in his previous annual reports. The following investigations are in progress or completed, and reports of them are in preparation:

1. Dr. F. F. Grout is continuing a study of the petrography of the Rove slate and of areas along the international boundary. Maps and sections are prepared and a report will probably be transmitted for publication in 1930-31. In the summer of 1930 Dr. Grout will be engaged in the study of certain granitic rocks in the area northeast of Duluth.

2. Dr. Stauffer continued his studies of the stratigraphy of the Paleozoic formations in southern Minnesota. Particular attention was given to the study of the limestones. Detailed sections were measured and faunal collections were made and studied. Among the latter several new species were found and these are being illustrated.

The limestones are nearly all suitable for agricultural purposes, particularly for fertilizers and mineral feeds. A few of them are low enough in magnesia to be used for the manufacture of Portland cement. Still others are well adapted to the building trades and are being used for such purposes today, altho on account of their high quality they should command a wider market. The basal portion of the Onkota limestone especially is well suited for sawing, yet no sawed stone is produced at the present time. Altho the state of Minnesota possesses some of the most beautiful and most durable building and ornamental stones in the United States, these do not find use within the state to the extent to which their grade and variety entitle them.

Mr. John A. Brown and Mr. A. E. Sandberg worked as assistants to Dr. Stauffer in this investigation.

3. Dr. George A. Thiel continued his investigations of the marl resources of the state and was engaged in the study of certain portions of the state in connection with the preparation of the geological map of Minnesota. Dr. Thiel has transmitted for publication a paper treating the relation of marl deposits to types of glacial sediments.

4. Dr. J. W. Gruner was engaged in the detailed mapping of pre-Cambrian rocks in Lake County. A report on part of this work has recently been published in the *Proceedings of the Lake Superior Mining Institute*, 1929, pages 179-87, under the title, "A Newly Discovered Major Unconformity in the Huronian Rocks of Northern Minnesota."

5. Mr. C. E. Dutton assisted Dr. Gruner in mapping pre-Cambrian rocks in Lake County, and during the latter part of the season of 1929 was in charge of similar work in Lake County.

Mr. Lowell B. Moon served as assistant to Mr. Dutton, and Mr. Rudolph C. Gebhardt as assistant to Dr. Gruner.

6. One of the chief projects of the state survey is a geological map of Minnesota, which has been in preparation for several years. This map is now completed and will be ready for distribution in 1931-32.

In addition to the special investigations outlined above and the preparation of the geological map of Minnesota, the State Geological Survey has answered numerous inquiries that have come to the office daily. The requests for information cover a wide variety of subjects, and the materials to be examined include waters, oils, clays, fluxes, ores, sand, gravel, crushed stone, building and ornamental stones, road metal, etc. In many cases samples are sent for testing to those interested, and thus the survey is attempting to aid in the bringing to the state of new industries that may profitably be operated within its borders. This service is rendered without charge to all applying, and the demand for it has steadily increased in recent years.

Respectfully submitted,

W. H. EMMONS, *Director*

THE MUSEUM OF NATURAL HISTORY

To the President of the University:

SIR: I have the honor to submit the following report of the condition and activities of the Museum of Natural History for the biennial period ending June 30, 1930.

MUSEUM

The museum during the past two years has continued to function actively as heretofore except that it has not been possible to construct additional major groups as the last space for such exhibits was filled with the completion of the Pipestone Prairie Group in October, 1927. However, the museum in its present well-filled, tho not crowded condition, presents an attractive appearance and serves to fulfill quite satisfactorily the purposes for which it was created and is used, which is, primarily, to interest and instruct the thousands of school children who annually come to the building to view the exhibits and listen to talks about them.

Much of the time of the director and part of the time of Mr. Breckenridge when not in the field have been devoted to the preparation of an illustrated work on the birds of Minnesota which will be published by the University Press for the museum. The money to defray the expense of publication has been donated by a group of interested persons and is in the hands of the university comptroller. It is expected that the work will be ready for distribution sometime next winter.

The museum was open every Sunday during January, February, and March from 2:00 to 5:00 p.m. and both the formal lectures at the Music Hall and lectures to children and adults at the museum have been maintained as in the past.

In view of the fact that the general attendance at the museum is steadily increasing, that the school work is about all the present staff can care for properly, and that a knowledge of the existence and character of the museum is spreading, bringing more and more contacts with organizations and individuals, it is felt by those in charge of the museum that it is becoming an important educational factor, not only in the University but throughout Minnesota and to some extent, at least, beyond the confines of the state.

Exhibits.—Twenty-three school groups and one medium sized group have been added during the period covered by this report. They contain the following subjects: medium sized; duck hawk with adult, nest and eggs and background view of north shore of Lake Superior at the "Palisades"; small school groups: coot with nest and eggs, crow and raven, crow with nest and eggs, pintail duck, wood duck, ruddy duck, sora rail with nest and eggs, spotted sandpiper with nest and eggs, black tern with nest and eggs, Cooper's hawk with nest and eggs, bank swallow with nesting site, flicker with nest and young, yellow warbler with nest and eggs, rose-breasted grosbeak with nest and eggs, scarlet tanager with nest and eggs, Baltimore

oriole with nest, house wren with nest and eggs, cedar and bohemian wax-wings, model of *Triceratops*, model of *Stegosaurus*, life history of polyphemus moth, life history of monarch butterfly, and a selection of Minnesota moths. All these groups, except the last, have colored backgrounds. Several other groups, both small and medium sized, are nearing completion.

ACCESSIONS TO MUSEUM, 1928-29

By Gift

Dr. Wm. P. Abbott, Duluth.....	1 snow goose, 4 blue geese, 1 old squaw duck (in flesh)
Biological Survey, Washington, D. C.	5 birds of paradise, backs of 11 American egrets, 2 snowy egrets, 1 little blue heron, 1 Louisiana heron, and 1 great blue heron, 25 ornaments (black), 10 ornaments (white), and 10 other colored ornaments (all confiscated plumage)
Mr. Charles Evans, Minneapolis	1 three-storied nest of yellow warbler
Mr. E. H. Forbush, Boston	1 half-tone cut of young burrowing owls
Miss Margaret Hill, Minneapolis.....	1 robin and 1 oven-bird (in flesh)
Mr. N. L. Huff, Minneapolis.....	1 female Connecticut warbler with nest and 4 eggs (bird in flesh) and 1 song sparrow (in flesh)
Mr. H. J. Jaeger, Owatonna.....	1 young snow goose (in flesh)
Miss Eleanor B. Jilson, St. Paul	1 male Connecticut warbler (in flesh)
Mr. Oliver V. Jones, Minneapolis.....	A collection of bird skins, nests, and eggs, including a beautiful skin, a nest, and egg of the now extinct passenger pigeon. Collection contained 1,055 eggs, 53 nests, and 23 bird skins
Mr. R. F. Jones, Minneapolis.....	1 cassowary (in flesh)
Mrs. E. H. King, Dassel.....	1 adult and 2 young hoary bats
Mr. D. Lange, St. Paul.....	1 cardinal (in flesh)
Dr. Elmer Langevin, Crookston.....	1 set of 13 prairie chicken eggs
Dr. R. B. Loucks, Minneapolis.....	2 porcupines (alive)
North Carolina State Museum, Raleigh, N. C.	6 photographs of sperm whale
Mr. Alfred Peterson, Pipestone.....	1 albino screech owl (in flesh) and 1 nest of warbling vireo
State Game and Fish Department, St. Paul	1 whistling swan (skin), and 2 separate lots of fish (alive for aquarium)
Mr. B. J. Shaver, United States Game Warden, St. Paul.....	5 mallards and 1 pintail (in flesh)
Mr. M. W. Smith, Minneapolis.....	1 partial albino green-winged teal (in flesh)
Mr. Gustav Swanson, Minneapolis.....	1 phoebe and 2 red-winged blackbirds (skins)
Mr. D. R. Thompson, Northome.....	1 evening grosbeak (in flesh)
Mr. H. Waters, Minneapolis.....	1 snowy owl (alive)

BY MUSEUM FIELD WORK

68 bird skins, 8 nests, 28 eggs, 23 small mammal skins, 375 feet of motion pictures, photographs, color studies, and accessories for small groups

BY PURCHASE

Mr. Anthony Prohosky, Dalton.....	1	gold-colored buffalo-fish (alive)
Mr. Marion W. Cooper, Mound.....	1	osprey (in flesh)
Mr. P. O. Frickland, Roseau.....	5	great horned owls, 1 great gray owl, 1 hawk owl, 2 short-eared owls, 1 sharp-shinned hawk, and 5 least weasels (skins)

ACCESSIONS TO MUSEUM, 1929-30

BY GIFT

Dr. Wm. P. Abbott, Duluth.....	1	surf scoter, 2 black scoters, 3 old squaw ducks (in flesh)
Mr. L. L. Cahlander, Excelsior.....	2	black rats (in flesh)
Dr. Wm. de la Barre, Minneapolis.....	1	salted skin of American golden-eye duck
Mr. J. M. Eheim, Hutchinson.....	1	great gray owl, 2 sparrow hawks, 2 red-tailed hawks, 1 Cooper's hawk, 1 albino dove, 1 Virginia rail, 1 scarlet tanager, 1 yellow-bellied sapsucker (skins)
Miss Elizabeth H. Foss, Minneapolis.....	1	large shell from Bermuda
Mr. P. O. Fryklund, Roseau.....	1	arctic three-toed woodpecker (in flesh)
Dr. Robert G. Green, Minneapolis.....	1	adult red fox (in flesh), 3 young red foxes (alive)
Mr. Sheridan Greig, Danbury, Wis.....	1	herring gull (in flesh)
Mr. H. J. Jaeger, Owatonna.....	1	blue goose, 1 Canada goose (in flesh)
Mr. George Kerstan, Minneapolis.....	1	least bittern (in flesh)
Dr. T. G. Lee, Minneapolis.....	13	small mammal skins (from Pacific Coast)
Mr. Stanley Liljgren, Scandia.....	1	flying squirrel (in flesh)
Dr. G. H. Luedtke, Fairmont.....	1	Hungarian partridge (in flesh)
State Game and Fish Department, St. Paul	1	snowy owl (in flesh), 1 set of caribou horns, 1 lot of fish (alive for aquarium)
Mr. Arthur G. Ruggles, St. Paul.....	1	albino gray squirrel (in flesh)
Mr. B. J. Shaver, St. Paul.....	14	wood ducks (in flesh)
Mr. E. D. Swedenborg, Minneapolis.....	1	blackburnian warbler, 1 black and white warbler, 1 golden-winged warbler (in flesh)
Mr. Gustav Swanson, Minneapolis.....	3	red-winged blackbirds, 1 yellow-billed cuckoo (skins)
Mr. A. C. Tilden, Hill City.....	1	star-nosed mole (in flesh)
Mr. A. N. Wilcox, Minneapolis.....	1	wood duck (in flesh)

BY PURCHASE

Mr. P. O. Fryklund, Roseau.....	9	bird skins: 2 sharp-tailed hawks, 4 hawk owls, 1 red-tailed hawk, 1 greater scaup duck, 1 glaucous gull
Mr. Sheridan Greig, Danbury, Wis.....	1	whistling swan (in flesh)
Mr. James S. Harris, Backus.....	1	golden eagle (in flesh)

BY EXCHANGE

4	bird skins: 1 Hudsonian godwit, 1 Cairn's warbler, 1 Carolina junco, 1 orchard oriole
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BY MUSEUM FIELD WORK

49	bird skins, 1 nest, 8 eggs, 690 feet motion picture negative, 63 photographs, color studies, and accessories for small groups
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PUBLICATIONS

The following papers have been published by members of the museum staff during the past two years:

Six articles have been prepared each year by the director from the museum records and have appeared in "The Season" department of *Bird-Lore*.

Mr. Kilgore and Mr. Breckenridge collaborated in the preparation of two short articles on the finding in Minnesota in 1929 of the rare nests of Nelson's sparrow and the Connecticut warbler which were published in *The Auk* (46:548 and 46:551-52. 1929).

An illustrated article by Mr. Breckenridge on "The Booming of the Prairie Chicken" was also published in *The Auk* (46:540-43. 1929). Other papers by Mr. Breckenridge were "Actions of the Pocket Gopher" in the *Journal of Mammalogy* (10:336-39. 1929. Illustrated); "Two Notable Minnesota Duck Records" in the *Wilson Bulletin* (42:59. 1930); "Imitating Water in Groups" in the *Museum News* (7, No. 2:7. 1929); and in collaboration with Mr. A. H. Bulbulian, "Notes on the Reproduction of Cattails and Coarse Sedges" in the *Museum News* (7, No. 19:9-12. 1930. Illustrated). Mr. Breckenridge also wrote an illustrated article of 13 pages entitled "Suggestions on the Construction of School Extension Groups" as one of a series of technical papers written by museum preparators throughout the country. This was issued by the museum in 1929 in the form of a mimeographed bulletin and distributed to museums and interested individuals. This series of publications is an effort to bring about better co-operation and a better understanding among the technical workers in the museums of the United States and Canada. In the past, museums have worked largely alone without knowing what others were doing, chiefly because preparators were not willing to communicate their methods for general use.

No. 3 of the museum's *Occasional Papers* is ready for distribution. It has a colored plate as frontispiece, 8 half-page halftones, and articles by Mr. Kilgore, Mr. Breckenridge, and the director based on the field work of the museum.

A book on the mammals of Minnesota has been written by Mr. T. Surber during the past year under the auspices of the museum with an introductory chapter by the museum director. The manuscript has been delivered to the University Press for publication as soon as possible. There is a present demand for a book of this kind.

FIELD WORK

Considerable field work within the limits of the state in the interests of the museum's collections and natural history files was done during the last two years. The principal expedition in 1928 was in the month of June of that year and was referred to in the last report. In the latter part of July, 1928, Mr. Breckenridge accompanied Mr. T. Surber, of the State Game and Fish Department, to the interior of Cook County in the Lake Superior region.

During the latter half of April, 1929, Mr. Breckenridge was in McLeod County studying the duck and shore bird migrations and on May 15, 1929, left for Pipestone and Lincoln counties in the southwestern corner of the state. From there he worked northward along the Minnesota-Dakota lines to the Canadian boundary. He was joined in Kittson County on June 12 by Mr. Kilgore and Mr. Surber and together they studied wild life conditions in the northwestern counties of the state. Returning, Mr. Kilgore and Mr. Breckenridge went eastward to central Itasca County to make a brief examination of certain localities, reaching Minneapolis July 1. During July and August, 1929, several short trips were made by Mr. Breckenridge and other members of the staff to Itasca, McLeod, and adjoining counties and to Lake Pepin.

From April 18 to May 1 and again from May 16 to 19, 1930, Mr. Breckenridge was in Pine County collecting specimens and taking motion pictures of the ruffed and sharp-tailed grouse and of the sandhill crane. The results of the motion picture work were most striking and satisfactory. So far as we know the remarkable courting "dances" of the sharp-tailed grouse have never been filmed before. In the middle of May a short trip was made by Mr. Breckenridge, accompanied by Mr. Gustav Swanson, to the north shore of Lake Superior for the purpose of obtaining certain materials needed to complete the Duck Hawk Group. An illustrated bulletin, known as *Occasional Papers* No. 3 is ready for distribution. It contains some of the important results of this field work. A second bulletin is planned for next winter.

FINANCES

University Museum supply budget.—The \$2,700 annual appropriation by the University for supplies and current expenses has been largely expended for the following items: 3 steel filing cases, 2 drawer card files, 39 shipping cases for school groups, 48 portable school cases, a colored plate for *Occasional Papers* No. 3 and printing, typewriter stand, lecture fees for the two Sunday afternoon courses, developing and printing 881 negatives, developing 1,268 feet motion picture negative, printing 897 feet motion picture positive, photographic supplies, miscellaneous office supplies, expenses of field work for the two years, and repair and construction work done by university shops. The museum help budget was exhausted during the last year and \$500 was transferred from the supply budget. There still remained to the credit of the museum in this budget on April 30, 1930, \$2,064.91.

University Museum help budget.—The annual appropriation was \$800. It was used to pay for additional office help on an hourly basis and for the care of the aquarium. During the past year so much extra clerical service was required in the preparation and transcribing of manuscripts, answering an increasing correspondence, and keeping up the files, that this fund was exhausted early in the spring and a transfer of \$500 was made from the supply budget.

Museum small group donation fund.—Mr. E. Floyd Allen has continued to send throughout the two years a monthly check for \$100, making

\$2,400 from July 1, 1928 to July 1, 1930. This fund has been used to pay the salary of Mr. Bulbulian (on an hourly basis) working in the shop as an assistant to Mr. Breckenridge, in the purchase of museum specimens, materials needed in the construction of the school groups, and, with the consent of Mr. Allen, in paying for some of the original paintings to be reproduced in the *Birds of Minnesota*. A donation of \$200 from Mr. Joseph R. Kingman to be used for the latter purpose was deposited in this fund and has been expended as directed by the donor.

There remained to the credit of this fund in the First Minnesota Trust Company on May 31, 1930, the sum of \$678.54 (check book balance), deposited in the name of Thos. S. Roberts, trustee.

Museum contribution fund.—Mr. James F. Bell's monthly contribution of \$75, amounting to \$1,800, has been received regularly throughout the two years. This fund is used to take care of current museum expenses supplemental to the regular university supply budget and is especially useful in emergencies when prompt action is required. At present it is being drawn upon occasionally to assist in paying for the originals of the illustrations for *Birds of Minnesota*.

There remained in the First National Bank of Minneapolis on May 31, 1930, a balance of \$659.55 to the credit of this fund in the name of Thos. S. Roberts, trustee.

Respectfully submitted,

THOS. S. ROBERTS, *Director*

THE INTERFRATERNITY COUNCIL

To the President of the University:

SIR: I am hereby tendering a report of the Interfraternity Council for the years 1928-30. I have confined this report to those activities which, in my opinion, are the most important trends in interfraternity relationships. These projects were started in 1928 and are now in the process of development. This report, then, indicates the extent of progress which has been made over this period of time.

INTERFRATERNITY COUNCIL PLEDGE TRAINERS GROUP

There are three important projects which have received the major amount of emphasis in the Interfraternity Council in the last two years. These are the training of pledges, fraternity scholarship and the Co-operative Buying Association.

The training of pledges is recognized by fraternity men as one of the most important concerns of the college fraternity. It is also one of the fields of fraternity activity in which there is the greatest need for improvement. The old view of pledge training was to get a number of strong oaken paddles and administer a number of swats with a strong right arm to each pledgeman, no matter what his department had been.

The modern point of view is that the pledge or probation period should be one of orientation, a period during which the freshman should become adjusted to his new environment. This orientation must be an individual matter. The same dose of medicine cannot be given to a score of sick men irrespective of the difference in their diseases. With this idea in mind, an organization was formed of the pledge captains of all the fraternities. The pledge captain is the upper classman chosen by each group to supervise the training of the pledgemen. This organization met weekly during the probation period to discuss common problems and develop a technique of pledge training. First, a card was devised which, when filled out, would give all available information on each pledgeman. These cards contain information of the freshman's family background, his high school scholastic and extra-curricular record, his economic status, his college aptitude rating, and all available information as to the condition of his physical and mental health. This information was secured from university files and in individual conferences with the pledgeman. This information is studied in order to find out the weak and strong points of each individual and, on the basis of facts discovered, to guide him to make the right adjustment to the new fraternity group and to the University as a whole. When serious difficulties are encountered, the pledge captain refers the man to the university guidance agency which can help him the most.

In the weekly meetings most of the discussions were led by Mr. Ben Schmoker, secretary of the Y.M.C.A., and graduate psychologist. In these discussions such topics as "How To Study," "Supervised Study," "How To Take Notes," "How To Prepare for an Examination," "Personal Health," and "Mental Hygiene," were taken up.

It is too soon, yet, to predict any measure of success for this project, but it is being continued for next year by vote of the council. Just the fact that the fraternities are looking at this problem in a constructive way is a healthy sign.

SCHOLARSHIP

A constant attempt is being made by the council to raise the scholarship of fraternities. Various methods have been used to bring this about. The pledge training program has been a part of this plan.

At the beginning of this school year, 1929-30, the following council ruling went into effect:

See Article I, Section 2, of Constitution and By-Laws of the Interfraternity Council,—

"The Academic Interfraternity Council requires that all pledges, to be eligible for initiation, must have made a grade average, for one quarter after pledging and preceding initiation, equal to that average necessary for graduation in the college to which the member belongs. If the pledge does not make such an average in one of the first three quarters after pledging, he must be dropped from the fraternity. A man so dropped can be repledged only after making the average for one quarter and must then be regarded as a new pledge under the rule."

This ruling places more emphasis on the selection of men with higher scholarship and enables the fraternity to get rid of the dead timber—men who have been pledged for three or four quarters and not initiated.

To aid the fraternities in this attempt at better selection, this office sends to each fraternity, before pledge week, a full list of the prospective rushees with their grades for the fall quarter. The fraternities are making an increasingly greater use of this list and seem to feel that it is a very valuable asset to rushing.

Two studies are being made this year in an attempt to throw additional light on the problem of fraternity scholarship. The first is a study of two hundred graduates of the University, half of whom are fraternity and half non-fraternity men. The purpose of this study is to determine the effect, if any, of membership in a college fraternity upon the scholarship of men of equal mental ability.

The second study is an analysis of the scholarship of the pledges of all fraternities. Only the members who were pledged in January, 1930, were used. The scholarship reports for each man for the fall quarter before he entered the fraternity and the winter quarter after he entered were used for this comparison. This study was made to answer the following questions:

1. What per cent of the entire class was initiated?
2. Was the inability of the fraternity to initiate certain individuals due to poor selection at time of pledging, or to poor guidance after pledging?
3. What per cent of the class improved their grades after joining the fraternity?
4. Do the students who cancel out fall in the high or low scholarship classes?

The comparison was arranged in the following form so that it would be possible to show the grades for fall, grades for winter, his improvement or depreciation in scholarship, college aptitude rating, and whether he was initiated. It also showed whether he was a good prospect with good guidance, a good prospect with poor guidance, a poor prospect with good guidance or poor guidance. Following is the interpretation of abbreviations used:

- O.K.—Initiated
- N.G.—Failed to be initiated
- I.—Improved in winter over the fall quarter
- D.—Depreciated in winter from the fall quarter
- C.A.R.—College aptitude rating.
- Comparison for an average fraternity to show plan of analysis.

The following summary shows that most of the failures come from poor selection of pledges.

ANALYSIS OF FALL AND WINTER SCHOLARSHIP OF FRATERNITY
PLEDGES, 1929-30

Summary

1. The total number in study is 348. This pledge class was pledged January 13, 1930.
2. 53 per cent of the pledges were eligible for initiation at end of winter quarter.
3. 54 per cent of the entire group improved in scholarship during the winter quarter over those of the fall quarter.
4. 75 per cent of those who were ineligible at end of winter quarter were also ineligible at the end of the fall quarter at the time they were pledged.
5. 70 per cent of those initiated were eligible at time of pledging.
6. 70 per cent of the entire group who improved had grades high enough to be initiated.
7. 67 per cent of the entire group of pledges who lowered their grades the second quarter were ineligible for initiation.
8. Percentage of ineligibles who missed their average by the following number of points:

Per cent	Points
4	.5
6	1
30	3
60	7
90	6.5
100	5.3

9. Of the pledges who were ineligible for initiation at the time of pledging, 70 per cent were also ineligible at the time of initiation.
10. Of the pledges who were eligible for initiation at the time of pledging, 75 per cent were eligible at the time of initiation.

11. 90 per cent of the group who left school for one reason or another before initiation had grades too low to be initiated.

The Minnesota Cooperative Buyers' Association, Incorporated, was started a year ago for the purpose of pooling the buying power of the fraternities and so enabling them to buy commodities at a much lower rate than formerly.

Eighteen fraternities and sororities are incorporated on this basis with a consequent saving for their groups of 20 to 35 per cent over retail prices on all household commodities. Since that time two more groups have joined the organization. It is hoped that the membership will be doubled by the beginning of next year. The organization is handicapped at present by the lack of facilities for expansion. A storehouse is needed near the campus with space for cutting its own meats.

Respectfully submitted,

OTIS C. MCCREERY,
President, Interfraternity Council.

FIELD SECRETARY AND GENERAL ALUMNI ASSOCIATION

To the President of the University:

SIR: I submit herewith a report on the work of the field secretary of the University and the secretary of the General Alumni Association for the years 1928-29 and 1929-30.

Alumni Board.—The directors for the year 1929-30 are as follows: Dr. W. F. Braasch, Arts '00, Medicine '03, head of the Department of Urology, Mayo Clinic, president; George R. Martin, Arts '02, vice-president of the Great Northern Railway Company, vice-president; Thomas F. Wallace, Arts '93, Law '95, president of the Farmers & Mechanics Bank, treasurer; E. B. Pierce, Arts '04, secretary; Clara H. Koenig, LeRoy A. Page, representatives of the College of Science, Literature, and the Arts; Fred A. Otto, Jay C. Vincent, Engineering and Architecture; Albert C. Arny, Frank W. Peck, Agriculture, Forestry, and Home Economics; C. F. E. Peterson, Tracy J. Peycke, Law; H. W. Jones, N. O. Pearce, Medicine; Torger A. Hoverstad, School of Agriculture; Joseph Shellman, Lewis W. Thom, Dentistry; Charles V. Netz, Pharmacy; Robert J. Mayo, Education; Frank J. Tupa, Business Administration; Ray P. Chase, Spencer B. Cleland, Irene R. Edmonds, Robert E. Ford, Arthur B. Fruen, Daniel C. Helmick, William H. Oppenheimer, Orren E. Safford, Leroy W. Sanford, Oswald S. Wyatt, directors at large; W. F. Braasch, first district; Charles G. Ireys, C. F. Keyes, H. F. Nachtrieb, and E. F. Zelle, honorary members.

Alumni Weekly.—Leland F. Leland, for six years editor of the *Alumni Weekly*, resigned September 1, 1929, to accept a position with the Banta Publishing Company of Menasha, Wisconsin. William S. Gibson, '27, who majored in journalism, and later was connected with the *Waseca Journal*, the *Faribault Weekly Pilot*, and the *Faribault Daily News*, was appointed editor. Very satisfactory progress has been made during the past year.

Alumni advisory committee.—One of the significant events in the alumni program has been the creation of the Alumni Advisory Committee composed of representative alumni from every corner of the state. It is the purpose of the association to have this group meet with the board of directors once or twice a year here on the campus and become familiar with the problems, plans, and purposes of the University. The first meeting was held December 15, 1928, at the Nicollet Hotel. Fifty-five alumni, including forty-three graduates from outside the Twin Cities and points as distant as Virginia and Ely, attended this gathering. The president of the University was invited to be present and outlined the University's needs. The spirit of the assembly was splendid and by unanimous consent it was voted that such meetings be continued. The second meeting was held Commencement Day, June 17, 1929, at a luncheon in the Minnesota Union, the third, Homecoming Day, November 15, 1929, and the fourth, June 9, 1930. There is no question but that this group has been, and will continue to be, of splendid assistance to the University.

Alumni and other meetings.—The following is a list of the gatherings which were held during 1929-30 under the auspices of the Alumni Association or which were held under the direction of alumni in the interests of the University. At the great majority of these the field secretary was

present and spoke. October 18, Chicago; November 1, Fergus Falls; November 7, Ely; November 8, Moorhead; November 9, Iowa City; November 15 (Homecoming), medical alumni, Alumni Advisory Committee, 1904 Law class, and general alumni (Minnesota and Michigan); November 23, Washington, D.C., Minnesota alumni at Big Ten Round-up; December 14, Twin City engineers at Curtis Hotel; January 2, University High School alumni; January 14, Chicago engineers; January 20, Waseca; February 3, Chicago; February 14, Crookston; February 22, Milwaukee; March 1, Redwood Falls; March 13, Detroit Lakes; March 15, Fergus Falls; March 16, Schenectady; April 7, New York City; April 12, Denver; April 29, Chicago; May 9, Washington, D.C.; May 22, Spokane; June 9, Alumni Advisory Committee, agricultural alumni, and general alumni; June 11, San Francisco, Big Ten meeting under auspices of Minnesota group; January 15, Optimists Club, Minneapolis; February 11, Gyro Club, Minneapolis; February 25, St. Paul Retail Credit Association; February 26, Faribault Rotary Club; March 17, Owatonna Rotary Club; March 20, Minneapolis Business Women's Club; May 29, Commencement exercises at Crosby; May 30, Memorial Day exercises at Crosby; monthly talks over WLB (*Alumni Weekly* hour).

Alumni Weekly subscriptions.—Every year outgoing seniors are urged to become life members of the Alumni Association and life subscribers to the *Alumni Weekly* at a total cost of \$50, with payments spread over a period of six years. The number responding has been approximately 300 a year. The Alumni Board has felt that the critical period in the transition to alumni membership was the year immediately following graduation and therefore requested the regents to make provision for closing this gap by insuring for each outgoing senior the first year's subscription to the *Alumni Weekly* at a cost of \$2.50. The alumni directors felt that if this could be done the association would have a much better chance of retaining their interest and active support for the rest of their lives. It is particularly gratifying to report that the regents have adopted the plan and the experiment is now under way.

Alumni directory.—Marked progress has been made toward the completion of the alumni lists despite the many interruptions in the directory office. A complete list of the Medical School alumni has been prepared and printed in a special number of the *Alumni Weekly*, May 31, 1930. Similar plans are under way for printing the School of Mines and Metallurgy list. It should be pointed out that Miss Potter does not have adequate assistance for the huge task confronting her. She has no permanent help. At Michigan for this purpose a staff of four full time assistants is employed while at Wisconsin a force of six full time workers is provided to keep this work up to date.

Additional activities.—For a further statement of the work of the field secretary during the biennium see reports of the Committee on Intercollegiate Athletics, University Functions, and the report of the Minnesota Union.

Respectfully submitted,

E. B. PIERCE, *Field Secretary of the University and
Secretary of the General Alumni Association*

THE BUREAU FOR RESEARCH IN GOVERNMENT

To the President of the University:

SIR: The Bureau for Research in Government is issuing a study of *The Administration of Workmen's Compensation in Minnesota* as Publication No. 9. This study has been prepared by Mr. Lloyd A. Wilford, a member of the Minnesota bar and formerly a student in the University. This study is significant because of a national survey which is now being made of workmen's compensation laws in the various states. Mr. Wilford has had considerable experience in practice in this branch of law, and in his study explains clearly the main provisions of the workman's compensation law of this state, the steps involved in a settlement of a workman's compensation case, and compares the work of the Industrial Commission with that of courts of law.

The bureau is also preparing for publication a study of the administration of game and fish laws of Minnesota. The importance of this subject in this state is very great, and no description of the administration of game and fish laws is available at the present time.

These two studies constitute a portion of a publication program which is to include studies of the various branches of state administrative activities in Minnesota. The program also includes supplementary studies in administrative law.

The bureau has collected a large number of official reports from state departments and is maintaining a library of pamphlet material and government documents which will be available to students engaged in the comparative study of any major activities of the various state governments. Materials for the study of federal-state relations, with particular reference to Minnesota, are also being collected.

During the past two years the students of the University and other persons seeking materials for the study of state and local government have in increasing numbers made use of the facilities of the library of the Bureau for Research in Government.

Respectfully submitted,
OLIVER P. FIELD, *Director*

THE EMPLOYMENT BUREAU

To the President of the University:

SIR: The following report for the biennium is a résumé of the report submitted last year, and an addition of this year's business.

While it has been a busy year, we have felt keenly the general employment condition. When employers broadcast calls for applicants, we have had candidates apply within an hour—only to find the position filled. This is indicated in the report by the number of requests for applicants that were not filled.

It is unquestionably true that a great many people on the campus are doing employment work—and sending to the Employment Bureau the difficult to place, or in some cases the unplaceable. In trying to care for these people we frequently lose out with employers. A student who may be very desirable as a student is often very undesirable as an employee.

I herewith submit the report of the business done by the University Employment Bureau for the biennium 1928-29, 1929-30, with some statements as to its less tangible progress.

The earnings listed on page 431 have been computed from the terms of employment and the follow-up reports. Board and room were estimated at \$40 a month, board alone at \$30, and a room alone at \$12.50. Summer work is included with the part time work. Permanent full time positions are calculated for one year on the basis of the original contract.

The services of the Employment Bureau in supplying university offices with clerical help have been increasing rapidly. Of the records for the two years, 696 placements, 118 were permanent positions. Temporary positions varied in duration from a few hours to some that were prolonged into a full year. Student services were used wherever the work was adaptable to student hours. Calls represent every major unit in the University.

The needs of the bureau have been to enlist more positions for students, maintain better records, and establish a greater confidence with both the students and the employers.

Our record system has been commented upon by some public employment services and by representatives of other universities for its advantages and its adequacy.

Since we had no funds for conducting a campaign to solicit patronage our primary aim was to establish a confidence that would of itself be good advertising. The increase of business done in 1928-29 over previous years would indicate considerable progress in this direction. The decrease in 1929-30 undoubtedly registers the general depression of employment. The number of unemployed in the Twin Cities combined with the field training courses arranged in business concerns by the School of Business Administration for its students has seriously affected the demand for other students. This is indicated in such items as the clerk—store.

In the fall of 1929-30 the Employment Bureau was fortunate enough to have done by a subcommittee in educational research the thing that it

THE EMPLOYMENT BUREAU

431

TYPE OF EMPLOYMENT	APPLICANTS REQUESTED				APPLICANTS ACCEPTED				TOTAL AMOUNTS EARNED IN BIENNIUM
	Men		Women		Men		Women		
	1928-29	1929-30	1928-29	1929-30	1928-29	1929-30	1928-29	1929-30	
Athletic events....	757	809	..	..	757	809	..	..	\$ 4,291.00
Carpenter	14	3	..	..	13	3	..	..	285.50
Chauffeur	27	22	..	..	26	16	..	..	10,328.00
Clerk—Drug	23	6	7	..	22	3	3	..	4,929.50
Clerk—Store	209	44	111	23	197	39	107	15	21,058.80
Collector	10	3	..	..	10	2	..	..	2,746.00
Cook	4	..	2	2	3	..	2	1	1,785.00
Draftsman	21	21	..	..	19	20	..	..	3,204.50
Electrician	9	..	..	..	9	..	..	..	2,931.50
Gardener	10	15	..	..	10	12	..	..	507.20
Housework	9	..	119	189	5	..	65	76	29,224.90
Janitor	41	26	..	..	38	17	..	..	8,796.50
Laboratory helper..	18	8	..	..	16	6	..	..	4,760.35
Library	8	1	..	3	8	1	..	2	1,480.00
Manual labor.....	66	57	..	..	65	52	..	..	17,980.00
Musician and enter- tainer	16	19	2	..	15	16	2	..	4,263.00
Nursemaid .....	..	4	32	48	..	2	28	32	4,636.80
Odd jobs	490	530	31	12	487	504	28	9	2,651.95
Office work	89	80	196	347	76	69	187	337	39,205.87
Oil station attend- ant	18	17	..	..	14	11	..	..	8,412.49
Printer	3	..	..	..	3	..	..	..	550.00
Service jobs.....	98	133	1	8	96	106	1	7	21,664.00
Settlement house work	10	4	11	13	10	3	10	6	6,605.00
Summer resort	15	4	3	8	15	4	3	8	7,275.00
Telephone operator	..	8	3	4	..	1	3	3	3,812.50
Tutor	37	49	10	19	35	41	8	17	1,633.50
Usher	48	15	..	7	39	8	..	3	8,247.00
Waiter	429	436	78	51	411	366	61	32	94,644.65
Miscellaneous	53	103	25	3	50	84	23	1	12,761.90
Totals	2,532	2,417	631	737	2,449	2,195	531	549	\$330,672.32
Sales on commission	241	43	21	..	145	32	9	9	26,429.50
Permanent work...	33	13	21	14	21	8	18	10	53,785.00
Grand totals...	2,806	2,473	673	751	2,615	2,235	558	568	
	5,279		1,424		4,850		1,126		
	6.702				5,976				\$410,886.82

should, theoretically, have been able to do for itself, namely, make contacts with Twin City employers for fall work, through the temporary services of a field man. While it is probable that a field man who could be permanently in touch with the commercial organizations could accomplish much, the results of the survey amounted to a gesture of friendly attitude from many

concerns with very few requests for applicants from any who were not already patrons of the Employment Bureau.

The bureau has now on its list of employers 1,294 firms and individuals. This does not include the individuals who have called for tutors, or typists for theses and manuscripts, nor university departments of which there are 87 listed.

During the second year of the biennium there was almost no effort made to place graduates. Requests were referred immediately to the different deans' offices for attention.

Certain functions such as the provision of odd candidates for service positions on the campus are not included in the report.

The bureau combined several weeks of office organization with its employment operations this year.

Respectfully submitted,

DOROTHY G. JOHNSON, *Director*

THE MINNESOTA UNION

To the President of the University:

SIR: I submit herewith a report, prepared by the manager, on the activities of the Minnesota Union for the biennium, 1928-30.

The Board of Governors for the past year has been composed of the following members: Students: Errol Anderson, Donald Burris, Donald Collins, I. J. Fleckenstein, Myron Griswold, Werner Gullander, G. Ray Higgins, Walter Manning, Bud F. Marquart, Philip Neville, E. G. Olson, and Robert Orth; Alumnus: Charles V. Netz; Faculty: E. B. Pierce and J. C. Sanderson.

The only unusual item to be recorded is the resignation of Minton M. Anderson, for nine years manager of the Minnesota Union, himself a graduate of the University and formerly a member of the Board of Governors. The Union has made great progress materially and spiritually under the guidance of Mr. Anderson, and it is with great regret that the board releases him to accept a position with the Aluminum Company of America. Two wings to the building have been constructed, internal improvements made, the services for the student body greatly increased and improved, and the Union as a student organization is now recognized as a real club house, functioning in the best interests of the men students of the University. To Mr. Anderson must be accorded a large share of the credit for these achievements.

The board has selected Mr. Ray Higgins, graduate in chemistry, and former member of the board in the capacity of house committee chairman one year and social committee chairman another year, to succeed Mr. Anderson as manager.

The report of the operations and activities of the Minnesota Union should be made in two sections; one covering the cafeteria dining rooms and banquet and committee luncheon rooms, and the other covering the club department of the student activity phase of the building.

During the past two years, the cafeteria department has enjoyed a larger patronage than previously. A great deal more special dining service has been furnished to large groups consisting of students, faculty, and administrators of the University than has formerly been requested. A few of the more important functions which have been accommodated are:

Alumni Homecoming banquet	Minnesota State Public School Music League
Dad's Day banquet	School of Business Administration banquet
"M" banquet	Law banquet
Mid-year senior farewell dinners	College of Agriculture Block and Bridle
Medical Six O'Clock Club	dinner
Engineering and alumni banquets	Cap and Gown luncheon
American Chemical Society	Mother's Day dinner
College of Education anniversary celebration	Alumni Commencement reunion dinner
	Legislative guests

Numerous other dinners were given for university honor guests. Besides these banquets, some of which include up to 1,200 guests, there is a constant demand for special lunches. These reservations are made by groups of all sizes by members of the university administration, faculty, alumni, students, besides guests from Twin Cities and state-wide organizations which are invited to use the campus as their meeting place. Some of these include: Rotary, Kiwanis, Lions Club, American Legion, Minnesota League of Municipalities, Minnesota Tax Payers Association. The demand for special lunches has grown to such an extent that further addition of space in the building has been provided for this service.

With the exception of necessary upkeep expenditures and equipment replacement, very little money has been appropriated for improvements in this department for the past two years.

The staff of the cafeteria department, which has remained practically unchanged during the past several years, is constantly striving to co-operate with all departments of the University to help maintain its position of service on the campus.

The student, or club, department under the jurisdiction of the Board of Governors and the manager is constantly increasing its usefulness to the student body, both as a center of activity and recreation and as a place for student social intercourse. During the existence of the Minnesota Union its function and place in the student extra-curricular program is constantly changing. The Board of Governors often finds itself in a position of sponsoring activities of all-university nature which require the financial backing of a permanent organization such as the Minnesota Union. Several projects which were originally fostered and established by the Minnesota Union until they grew to be too large to be included in our program are now being administered by well-defined committees and organizations.

One of the projects which the Minnesota Union has undertaken is the securing of busts of the university presidents. Mr. S. Chatwood Burton is the artist who is preparing these busts. No definite decision has yet been reached as to the location of them after they are finished.

Freshman Advisory System which sponsors the Tutoring Bureau has been given space in the Minnesota Union during the past two years.

The Board of Governors is continuing the custom of inviting the mid-year graduating classes to a farewell dinner as guests of the Minnesota Union.

During the past year the Minnesota Union has co-operated with several departments, such as the Dean of Student Affairs, Y. W. and Y. M. C. A. in sponsoring a series of informal social activities, the purpose of which was to provide some means of socializing the very large number of students who are not able to enjoy regularly priced student social functions.

In co-operation with the Intramural Athletic Department, space was furnished in the building during the winter quarter for an indoor golf course, which proved reasonably successful in its experimental stage.

The Minnesota Union rendered a service to the Student Health Service

during an epidemic of influenza in the winter of 1928 by providing space for an emergency hospital ward in the ballroom of the building.

Periodically the Board of Governors sponsors social activities, both of university and class nature, such as stag mixers, Freshman Week programs, senior week Mardi Gras, and concerts.

The above paragraphs give a very brief description of the activities of the Minnesota Union other than its normal function in maintaining the building as a suitable club house for the men on the campus.

Financial statements for the years 1928-29 and 1929-30 are herewith included.

INCOME AND EXPENSES

JUNE 30, 1929

INCOME	
Candy and tobacco sales	\$12,619.07
Billiards	6,273.50
Ballroom rental	927.50
Miscellaneous income	108.36
Minnesota Union activities	211.50
Barber shop rental	318.69
Telephone pay station	12.95
Soda fountain sales	9,664.48
Machine rentals (football and golf machines)	51.57
Weighing scale receipts	145.65
Net income	\$30,333.27
EXPENSE	
Candy and tobacco purchases	\$ 9,489.20
Billiard room purchases	413.38
Salaries	10,408.26
Union activities	799.44
Magazines and periodicals	141.33
Miscellaneous expense	215.39
Soda fountain purchases	4,650.27
Office expense	32.03
Insurance and bonds	79.08
	\$26,228.38
OPERATING GAIN	\$ 4,104.89
Add other income: interest on investments	166.87
	\$ 4,271.76
Less depreciation on equipment (12½ per cent).....	1,309.10
Net gain to June 30, 1929	\$ 2,962.66

THE PRESIDENT'S REPORT

INCOME AND EXPENSES

JUNE 30, 1930

INCOME

Candy and tobacco sales	\$12,710.34
Billiards	6,223.83
Ballroom rental	800.00
Miscellaneous income	83.75
Minnesota Union activities	244.33
Barber shop rental	311.33
Gopher photo rental	40.00
Soda fountain sales	9,874.02
Weighing scale receipts	193.86
Ping pong receipts	409.92
	<hr/>
Net income	\$30,891.38

EXPENSE

Candy and tobacco purchases	\$10,268.70
Billiard room purchases	328.99
Salaries	10,437.59
Union activities	959.36
Magazines and periodicals	126.09
Miscellaneous expense	162.55
Soda fountain expense	4,764.59
Office expense	39.15
Insurance and bonds	92.88
	<hr/>
	\$27,179.90
OPERATING GAIN	\$ 3,711.48
Add other income: interest on investments	112.50
	<hr/>
	\$ 3,823.98
Less depreciation on equipment (12½ per cent)....	\$ 1,160.35
	<hr/>
Net gain to June 30, 1930	\$ 2,663.63

Respectfully submitted,

E. B. PIERCE, *President*
Minnesota Union Board of Governors

THE INSTITUTE OF CHILD WELFARE

To the President of the University:

SIR: I submit herewith my report for the two-year period 1928-30.

At the beginning of this period the increased appropriations available for the work of the institute became effective with a consequent enlargement of the institute program over that of previous years and some reorganization of the staff. The enlargement of the program affected all the major departments of the institute; the Nursery School and Experimental Kindergarten, research, instruction on the campus, and parental education. During this period, the front third of the Old Law School Building was made available for the use of the institute, thus providing additional space for the activities of the organization and facilitating the development of the program.

THE NURSERY SCHOOL AND EXPERIMENTAL KINDERGARTEN

In the Nursery School the same policies of selection previously developed were maintained. The Nursery School was in full day session during the academic years of 1928-29 and 1929-30, and in half day session during the first term of summer school in 1928 and 1930. It was used extensively for demonstration and observation purposes, for the conduct of research projects, and for the training of teachers and workers. The enrolment of the Nursery School throughout this period was maintained at 36, with an age range of two to five years.

The Experimental Kindergarten for five-year-olds was opened in September, 1928, and was in session during the academic years 1928-29 and 1929-30 and the first term of summer school in 1929. The enrolment in the kindergarten varied from term to term between 40 and 50. The establishment of the kindergarten increased the observational and research facilities of the institute and made available an additional unit for demonstration and training purposes.

RESEARCH

During the two-year period the institute was very active in research. Fifty new projects are listed below, with serial numbers which continue on from the lists presented in earlier reports.

NEW RESEARCH PROJECTS, 1928-30

101. Perception of vertical and horizontal distances in young children. (F. Jones—Institute.)
102. Personality traits of adolescents. (R. Smith—Education.)
103. Vocational interests of adolescents. (P. Rulon—Education.)
104. The effect of ultra-violet radiation upon growth, appetite, and food consumption. (R. Glockler and J. Leichsenring—Home Economics.)

105. Correlation of ultra-violet absorption to the development of immunity. (F. W. Schlutz and W. W. Wetzel—Pediatrics.)
106. Factors influencing the formation of friendships in young children. (R. C. Challman—Institute.)
107. Problem solving in young children. (E. Matheson—Psychology.)
108. The mental development and adjustment of foster children. (A. Leahy—Sociology and State Board of Control.)
109. The intellectual development of twins. (E. Day and F. L. Goodenough—Institute.)
110. The vocal sounds of a blind-deaf girl. (D. McCarthy—Institute.)
111. The modifiability of behavior in a blind-deaf child. (F. L. Goodenough—Institute.)
112. An age analysis of the form and function of children's questions. (E. A. Davis—Institute.)
113. The experimental error inherent in measuring the human body. (E. Boyd—Institute.)
114. The effect of high mineral content vegetables on the development of teeth. (J. E. McClendon, V. Haury, and J. C. Cohen—Physiological Chemistry.)
115. The irritability of the young infant. (M. Shirley—Institute.)
116. The development of walking in the infant. (M. Shirley—Institute.)
117. The relation between the musical ability of parents and the musical ability of kindergarten children as measured by the Seashore tests. (R. C. Friend—Institute.)
118. Racial differences in the intelligence of pre-school children measured by the Atkins non-language test. (B. Marx—Institute.)
119. Factors affecting the amount of teacher's time taken by nursery school children. (J. C. Foster—Institute.)
120. The effect of the immediate surroundings upon free associations in children. (H. Sundberg—Institute.)
121. The relation between the incidence and type of mental disease and birth order in the family. (E. A. Schuler—Sociology and State Board of Control.)
122. The relation between the complexity of the habit to be acquired and the form of the learning curve in young children. (M. Mattson—Institute.)
123. The relation between the fears of parents and the fears of children. (E. McGinnis—Institute.)
124. School records of illness at various ages. (J. C. Foster—Institute.)
125. Gastric motility in the asthenic child. (A. Rupp, F. W. Schlutz, and others—Pediatrics.)
126. The effect of vitamin B on anorexia and gastric motility. (A. Rupp—Pediatrics.)
127. Gastric motility in infants with pylorospasm, pyloric stenosis, and periodic vomiting. (A. Rupp—Pediatrics.)
128. A study of the diurnal variations of height and weight in the human body during growth. (C. E. Palmer—Anatomy.)
129. A study on the normal growth of the weight and component parts of the thymus gland in the postnatal period and the involution of the thymus and its parts under certain pathological conditions. (E. Boyd—Anatomy.)
130. The physical constitution of suspected tuberculous children. (V. Spaulding—Anatomy.)
131. The action on gastric motility of the intravenous injection of certain fatty acids. (R. L. Wilder—Pediatrics.)
132. The action of atropine and adrenaline on the gastric hypermotility of insulin hypoglycemia. (R. L. Wilder and F. W. Schlutz—Pediatrics.)
133. The influence of excessive milk feeding on gastric motility and its relation to chronic anorexia. (W. J. Siemsen—Pediatrics.)
134. The action of volatile fatty acids on the gastric motor mechanism in dogs. (F. W. Schlutz and R. L. Wilder—Pediatrics.)
135. Relation of the test scores of infants under three months to the intelligence of the mothers. (J. Conger—Institute.)
136. A study of dominance-submission in young children. (T. B. Cooke—Institute.)

137. Social interaction during the first year of life. (A. C. Mendham—Institute.)
138. An analysis of the factors affecting speech defects in young children. (J. R. Springob—Institute.)
139. The effects of speech training upon the speech of young children. (A. Sommer—Institute.)
140. Play activities of children in the first six grades. (J. C. Foster—Institute.)
141. Objective study of the interests of young adolescents. (E. Hauge—Institute.)
142. A comparative study of finger-tapping in children and adults. (M. A. Tinker and F. L. Goodenough—Psychology.)
143. A comparative study of several methods of measuring speed of tapping in child and adult. (F. L. Goodenough and M. A. Tinker—Psychology.)
144. Interference of motor habits as shown by eye-movements in the reading of English and Hebrew. (B. Bearman—Institute.)
145. Analysis of clientele of study groups and correspondence course program. (J. E. Anderson, E. A. Rundquist, and E. McGinnis—Institute.)
146. Factors influencing continued attendance and discontinuance of attendance at study groups. (M. L. Faegre, E. A. Rundquist, and E. McGinnis—Institute.)
147. A study of the modification of parental attitudes by parental education. (E. A. Rundquist—Institute.)
148. Comparison of the local leader program for rural parents with the program for city groups led by specialist. (E. McGinnis and B. O. Fish—Institute.)
149. Analysis of the factors affecting the conduct and results of the study group technique in parental education. (E. McGinnis and E. A. Rundquist—Institute.)
150. Summary of child development material incorporated in the Home Economics programs of elementary and high schools in Minnesota. (E. McGinnis, A. Keever, and W. McNeal—Home Economics.)

In Table I, a summary of the research projects by departments, is presented.

TABLE I. SUMMARY OF RESEARCH PROJECTS BY DEPARTMENTS

Anatomy	24
Dentistry	5
Pediatrics	17
Psychology	11
Home Economics	9
Physiological Chemistry	2
Education	10
Sociology	10
State Board of Control.....	2
Institute of Child Welfare.....	71
	161
Less duplication caused by projects in which two or more departments are involved	11
	150

From this table it is evident that the institute has maintained its co-operative relations with other university departments. Relatively the number of projects carried on by the institute proper has increased somewhat over previous years, due to the greater number of graduate students pursuing work for advanced degrees in the institute.

In Table II a summary of the projects by their status as of July 1, 1930, is presented.

TABLE II. SUMMARY OF RESEARCH PROJECTS BY PRESENT STATUS

Completed and published	41
Completed, in press, or ready for publication.....	21
Completed and in form of thesis.....	8
Research completed, in preparation for publication.....	8
Completed, but held pending another project.....	1
In progress with partial publication already.....	4
In progress	47
Combined with other projects.....	6
Dropped	14

150

From this table it is apparent that during the past two years a large number of projects have been carried through to completion and have found their way into print.

INFANT STUDIES

The research projects involving the co-operation of twenty-five mothers in the study of the development of infants from birth to two years which commenced in the summer of 1927 was carried through to completion in the fall of 1929, except for infrequent periodical examinations which will continue as long as the children are available. During the past year the records kept by the mothers together with the detailed observations made by the staff have been in process of analysis. The first publications resulting from this study are now available for printing.

INSTRUCTION

The program of instruction carried on by the institute increased during the biennium, both with respect to the number and variety of courses offered and the number of students enrolled. In 1927-28, twelve courses were offered, in 1929-30, the number had grown to nineteen. Courses are offered at four levels, general courses for undergraduates, specific training courses for nursery school and kindergarten teachers, courses for seniors and graduate students, and courses for graduate students only. In Table III a summary of the courses and enrolment in terms of those completing courses is presented.

TABLE III. NUMBER OF ACADEMIC COURSES OFFERED AND ENROLMENT

	1928-29		1929-30	
	Courses Offered	Students Completing	Courses Offered	Students Completing
Summer	7	117	9	143
Fall	11	191	11	227
Winter	10	140	11	212
Spring	11	170	12	228
Total	39	618	43	810

With the enlargement of the institute program and the development of the kindergarten curriculum for the preparation of nursery school and kindergarten teachers was set up. During the year 1928-29, 9 students completed the curriculum in nursery school and kindergarten education, as compared with 4 the preceding year. In 1929-30 the number was 14.

The number of graduate students in the institute has steadily increased. During the year 1928-29, two students received their Ph.D.'s with majors in child welfare, and one student received a Master's degree. The figures for the year 1929-30 are not yet available. A number of graduate students in other departments carried on investigations in the institute, utilizing institute material for their theses. Many of these minored in child welfare, and pursued their majors in other departments.

During the academic year 1928-29 two fellows for research in child development and three scholars in child development were present working under grants under the auspices of the Committee on Child Development of the Division of Anthropology and Psychology of the National Research Council. During the year 1929-30 one fellow and two scholars were in attendance. During the Summer Session of 1928, thirteen fellows working under scholarship or fellowship grants from outside agencies were present, while in the 1929 summer school four such fellows or scholars were in attendance.

PARENT EDUCATION

In its service of the dissemination of information to the people of the state, particularly parents, the two-year period shows marked development over previous years. As in previous years the parent education service included four main types of activity: extension courses for credit, correspondence courses both for credit and not for credit, study groups, and agricultural extension projects.

Two outstanding developments of the biennium were the establishment of the Duluth center of the Institute of Child Welfare in September, 1928, with a resident worker in charge, and the setting up of a child training specialist in the Agricultural Extension Division of the University in July, 1929, to take charge of the rural work in the state. Both of these developments are now well established and are making substantial contributions to our program.

In addition to an increased staff in the central organization for the conduct of study groups in the Twin Cities and the carrying on of the correspondence and extension activities, more than a beginning has been made in the analysis of the methods, clientele, and results of our parental education program. Projects 145 to 150 in the list of research projects concern this phase of our work and are so well along now that they give promise of excellent return.

Table IV presents a summary of the parent education activities during the biennium.

As compared with the 1927-28 or last report, we find the number of persons reached through every phase of the parent education program de-

cidedly increased. In 1926-27 a total of 2,632 persons were reached, in 1927-28 a total of 4,836 persons, as compared with 4,955 and 8,790, respectively, for 1928-29 and 1929-30.

TABLE IV. GENERAL SUMMARY OF PARENT EDUCATION ACTIVITIES

	1928-29		1929-30	
	No. Groups	Enrolment	No. Groups	Enrolment
Extension courses				
Credit	8	97	4	70
Correspondence courses				
Credit	(1)	18	(2)	35
Non-credit	(1)	2,235	(1)	3,325
Study groups				
Minneapolis	22	435	20	525
St. Paul	33	605	28	560
Duluth	15	326	27	588
Towns and small cities.....	7	195	12	238
Agricultural extension	0	0	116	1,618
Total enrolled	85	3,911	207	6,960
Visitors	—	1,044	—	1,830
Total persons reached.....	—	4,955	—	8,790

If we consider the distribution of our work over the state, we find that the non-credit correspondence courses reach almost every community in the state. Rural projects under the Agricultural Extension Service were carried on in Anoka, Carleton, Dodge, Olmsted, Pine, and Pipestone counties in the year 1929-30. The large centers of population in the Twin Cities and Duluth are effectively reached through resident workers. Since the town and small city falls somewhere between, the institute has been experimenting with projects under its central staff in such communities. During 1928-29 such projects were developed in Ely, Virginia, and St. Cloud, in 1929-30 in Austin, Albert Lea, Dodd, Glen Lake, Hopkins, Jackson, and White Bear.

With reference to the topics considered in the study group work, Table V shows that our work is branching out from the pre-school field into the school and adolescent field. This is in line with the policies outlined in the request which resulted in increased funds for this period.

TABLE V. TOPICS OF STUDY GROUPS

	1928-29	1929-30
Pre-school	42	30*
School	21	53
Adolescent	5	10
Experimental	1	..

* 116 agricultural groups on this topic also.

In the conduct of its extension activities the institute co-operates with many agencies. In Table VI a brief summary is presented showing the nature of this co-operation. Altho the parent-teacher associations furnished the great majority of contacts for developing study groups, nevertheless other agencies in the community play an important part.

TABLE VI. STUDY GROUPS BY AUSPICES

	1928-29	1929-30
Parent-Teacher Associations	55	63
College clubs	5	2
Churches	5	9
Settlements	2	1
Home center	2	1
Agricultural extension service .....	..	116
Others, including evening schools, women's clubs, Y.W.C.A., etc.	8	7
	<hr/> 77	<hr/> 199

A notable increase in the number of traveling libraries in use in connection with the parental education program occurred. While in 1927 only 20 such libraries were sent out, in 1928-29 the number had grown to 42, and in 1929-30 to 67.

PUBLICATIONS

The two-year period was very active from the standpoint of publication. Two monographs, the first by Willard C. Olson, entitled *The Measurement of Nervous Habits in Normal Children*, Monograph Series No. III, and the second by Dorothea McCarthy, entitled *The Language Development of the Preschool Child*, Monograph Series No. IV, were published by the University of Minnesota Press.

So much demand existed for Monograph No. I by Josephine C. Foster and John E. Anderson, entitled *The Young Child and His Parents*, that a new edition was printed, revised so as to bring the case material up to date.

Child Care and Training by Faegre and Anderson, published by the University Press, proved so popular that a second edition was printed, which is now almost exhausted, necessitating a third edition soon. Two other books prepared by members of the staff appeared, published outside the University Press.

Thirty-three scientific articles in a variety of journals in a number of scientific fields have appeared since the last report.

A circular series was started by the institute to include material for which there is much demand and which does not warrant major publication. So far four numbers have appeared in this series, No. 1, *A Manual for the Organization of Study Group*; No. 2, *Publications of the Institute*; No. 3, *A Scale for Rating Living Room Equipment*; and No. 4, *The Sleep of Young Children, a Report to the Parents Who Participated in the Study*.

THE PRESIDENT'S REPORT

MISCELLANEOUS ACTIVITIES

During the biennium the institute has participated in a number of conferences, furnished a number of exhibits, and co-operated in various ways with many organizations and agencies. Chief among these may be mentioned the Northwest Conference on Child Health and Parent Education, and the Regional Conferences on Social Work under the auspices of the State Board of Control, the University Extension Division, and the State Board of Health.

There has been a heavy demand for talks and addresses from the institute staff. During the year 1928-29, 85 were given. In the year 1929-30 the number was greatly increased, making a total of 213, of which 153 were formal addresses, 49 were informal such as the conduct of round tables, etc., and 11 consisted of the presentation of papers before scientific societies.

CONCLUSION

The biennial period from 1928 to 1930 has been one of marked growth in the institute program, whether it be approached from the point of view of research, of instruction on the campus, or of the dissemination of information to the people of the state. As an organization it can look forward to the next biennium with a feeling of confidence, and every hope of further substantial accomplishment.

Respectfully submitted,

JOHN E. ANDERSON, *Director*

THE SOCIAL HYGIENE BUREAU

To the President of the University:

SIR: Herewith I submit a report of the Social Hygiene Bureau for 1928-30.

The work of the bureau is a pioneer effort and one which has not yet reached the stage of academic routine. Therefore a short statement of its original objectives is necessary as a preliminary to a summary of its present status.

In 1925, the University of Minnesota at the request of the Women's Co-operative Alliance, Inc., of Minneapolis accepted a grant of \$51,250 from the Bureau of Social Hygiene of New York City to be used through equal yearly grants over a five-year period on a social hygiene program which had three projects as follows:

Project 1.—The careful research necessary to analyze and interpret the materials already accumulated and those to be accumulated by the Women's Co-operative Alliance in its personal interviews with mothers in house-to-house contacts. This should result in a report of lasting value to all social hygiene workers.

Project 2.—A study, by a trained worker in the field, of the materials and methods which are at present being used by the Women's Co-operative Alliance in making house-to-house contacts with mothers, and in holding the resulting conferences with groups of mothers. This study to be followed by experimental use of the improved materials and methods, with a final evaluation and criticism of the materials used and of the technique of presentation. There should result from this study a book which would be a practical guide for social hygiene workers in the field.

Project 3.—Following these two studies a training school for parent advisers should be conducted on a scale such as to attract social hygiene workers from other cities. This training school should give to prospective workers the scientific interpretation of the facts revealed both in Minneapolis and elsewhere, and set forth clearly the subject-matter and technique most serviceable for the education or re-education of parents in matters of social hygiene.

During the first two years, the work was under the direction of a Joint Committee on Social Hygiene appointed by the president and composed of members of the university faculty and of the board of directors of the Women's Co-operative Alliance. During this period, the program was not of sufficient scope to utilize the entire sum allotted. According to the rules of the Bureau of Social Hygiene, the money voted by them, for each year, must be used during that year by the agency to which it has been given or it must be returned to the Bureau of Social Hygiene. Had this procedure been followed in this instance, it would have reduced the original grant by several thousand dollars.

In September, 1927, the Joint Committee on Social Hygiene became an advisory committee and a director was appointed to carry forward the program. In February, 1929, at the request of the University, the Bureau of Social Hygiene of New York City agreed to prolong the program for an additional year and thus to carry it to July, 1931.

The Bureau of Social Hygiene accepted the plan proposed by the president of the University and agreed to give a grant equivalent to the dif-

ference between the original sum and the amount of money spent by the University. Further, it agreed to give an additional \$5,000 to match the sum of \$5,000 which the University would furnish.

This plan would permit the completion of the research reports and would provide an opportunity to develop methods and procedures in connection with Project 3. If in this period, effective and feasible methods and procedures should be developed for the integration of sex education into the university curriculum, the University, according to the letter of request, would then take under consideration the inclusion of funds for this program in the biennial budget for 1931-33.

PRESENT STATUS OF PROGRAM

Projects 1 and 2.—The first research reports in these projects are nearing completion. They will consist of:

1. A narrative history of the development of the parental sex education program of the Women's Co-operative Alliance and its present status, techniques, methods, and materials.
2. A description of methods, techniques, and materials used in assembling the university research data.
3. A statistical analysis of these data which should show whether or not this particular program in parental sex education has been effective and if so, how and in what degree.

The research profited by the sympathetic counsel and active co-operation of Dr. J. Arthur Harris who in June, 1929, voluntarily offered to supervise the statistical reports. Since the death of Dr. Harris, Dr. Richard E. Scammon has assumed the responsibility of final criticism. Thus, the research is assured of the best scientific treatment which is available in this country. The budget of the Social Hygiene Bureau could not have afforded to pay for such authoritative counsel.

Further reports on these data are projected for next year.

Project 3.—A satisfactory development of Project 3 is the real objective of the program. The activities in this project have included:

1. A survey of courses offered on campus as they relate to sex education.
2. A study by actual experimentation of possible methods of integrating sex education into the curriculum and where this could be done.
3. A study of available facilities, such as schools or social agencies, which might be used for field observation and training.

SURVEY OF COURSES AS THEY RELATE TO SEX EDUCATION

A survey was made this year of courses offered in the University as they relate to sex education. One hundred faculty members were interviewed. In order to give unity and uniformity to the information, the materials commonly included in sex education were outlined under eight points and a number of subheadings. During each interview, questions and explanations on any or all points were possible. Each interview was then summarized, submitted to, and "blue penciled" by the person interviewed. The results were then charted.

Only two of the established courses offer material of much significance in this field. A number of courses treat of various matters which might relate to actual sex social relationships if the student could be helped to interpret his information and co-ordinate it with human needs and activities.

RESULTS OF THE STUDY IN METHODS

1. The feasibility of courses for parents through the General Extension has been established.

2. The School of Preventive Medicine and Public Health for several years has included social hygiene in P.M.&P.H. 59. This course had consisted of a series of lectures by different persons. It has now been developed through the Social Hygiene Bureau into a course, Community Program in Social Hygiene, consisting of lectures, required readings, book reports, and projects which present actual life situations met in the field of public health nursing.

3. At the request of, and in co-operation with, the Division of Home Economics, methods and materials were tried out in the course, H.E.Ed. 49, Observation and Teaching. It was considered so satisfactory in methods and of such vital importance in content, that plans for further development are under way.

In conference, Dean Edward M. Freeman, the director of the Social Hygiene Bureau, the director of the Home Economics Division, the supervisor of H.E.Ed. 49, and staff members from the Department of Genetics adopted, for next fall, a definite plan of co-ordination in the three fields of home economics, genetics, and sex education. It is believed that in this plan a method of practical procedure has been found.

4. The Department of Physical Education for Women is actively interested in this same line of procedure and co-operative projects have also been carried out in that department this year.

5. Without formal planning, a consultation service has grown up quite naturally. Evidence would indicate that such a service would meet a vital need not only in the University and Twin Cities but in the state in general. The Social Hygiene Bureau has not been able to accede to the demands which have come, totally unsolicited, from parents and teachers over the state.

AVAILABLE FACILITIES

Among the important items in an education program such as this are suitable and practical channels for observation and training in methods and materials. A project is under way which it is believed will give training facilities in this field for students in Home Economics, Physical Education, Public Health Nursing, and, if those departments so desire, for students in social work and science.

It is confidently expected that this next year will see the rounding out of all of these plans and the discovery and trial of additional methods and procedures and thus the program will be definitely developed.

Respectfully submitted,

CHLOE OWINGS, *Director*

THE UNIVERSITY PRESS

The University Press can report progress in several directions during the biennium, which covers its second and third years of activity. An increasing number of individuals and organizations are turning to the press as the agency for the publication of their work. For example, the press published in the fall of 1929 for the Norwegian American Historical Association a volume of travel letters entitled *America in the Forties*. It has also entered into an agreement with the United States Department of Agriculture for the publication, under the joint editorship of Dr. C. J. Galpin of the Federal Department and Professor Sorokin and Professor Zimmerman of the University of Minnesota, of an extensive systematic survey of rural sociology to be accompanied by source material from the literature of all countries and periods. The first volume will appear in the fall of 1930. The press has also been made the publication agent for a two-volume work on the *Birds of Minnesota*, by Dr. Thomas S. Roberts, financed by the Thomas S. Roberts Memorial Fund contributed by a group of Minneapolis donors in appreciation of Dr. Roberts' work in natural history.

In this connection, attention might be called to the opportunity such funds afford to persons interested in establishing a permanent memorial for the advancement of science and scholarship. The possession by the Yale University Press of a number of such bequests has enabled it to finance many distinguished works, either too expensive or of too limited an appeal to warrant publication from current funds.

Increased publishing activity has necessitated enlarged quarters and the addition of two editorial assistants to the staff. Both additions, however, are inadequate to our rapidly growing program. A university press, because of the character of its publications, must have an even more highly specialized and competent staff than that of a commercial publishing house. The publication of ten or fifteen volumes annually requires all the various editorial, manufacturing, and distributing services needed by a list of one hundred or more.

Sales show a rather notable increase; during the second year the increase was about 12 per cent over the preceding year, but during 1929-30 sales have doubled—this in spite of financial depression and a decline reported by general publishers. Receipts from sales represent the contribution made by the reading public to the publishing activities of the University, and are probably a fair index of the need and demand for such publishing. A nation-wide survey made recently for one of the foundations indicates that the need for non-commercial agencies for scholarly publishing is increasing with the increasing costs of publication and the consequent necessity on the part of commercial publishers to produce and sell large editions. An edition of two or three thousand is necessary before any element of profit can be counted on.

Our sales record is undoubtedly due in large part to an active promotion program. This has included national advertising in general and special periodicals, circularization of catalogs and of a variety of folders and sales letters, news releases, reviews, exhibits, and window displays. An innovation in publicity methods was a series of radio talks given weekly during the winter quarter of 1930 from Station WLB. During January and February, University Press books and their authors were featured, and during March eight talks, presenting in popular form aspects of "Educational Pioneering at the University of Minnesota," were given by the following speakers: President Lotus D. Coffman, Dean Guy Stanton Ford, Dean J. B. Johnston, Professor D. G. Paterson, Dean E. M. Freeman, Professor Earl Hudelson, Dr. Harold S. Diehl, and Dr. Ellett deBerry. Mrs. Margaret S. Harding, editor of the press, served as announcer for the series.

A number of the earlier publications of the University and the press have been completely sold out and new editions of the following have been issued: *Child Care and Training*, by Marion L. Faegre and John E. Anderson; *The Young Child and His Parents*, by Josephine C. Foster and John E. Anderson; *Teaching Aids for the Asking*, by Homer J. Smith; *Scales for the Rating of Teaching Skill*, by Leo J. Brueckner; *Man in Nature and Society*, by the staff of the Orientation Course; *Modern History Syllabus*, by Alice Felt Tyler; and oral hygiene leaflets.

The following new titles (in chronological order) have been issued during the past two years:

- Australasian Preferential Tariffs and Imperial Free Trade*, by Cephas D. Allin.
- The Attitude of Mothers Toward Sex Education*, by Helen L. Witmer.
- Extra-Curricular Activities at the University of Minnesota*, by F. Stuart Chapin and O. M. Mehus.
- Comparative Pupil Achievement in Rural, Town, and City Schools*, by M. J. Van Wagenen.
- Master's and Doctor's Theses in Education, University of Minnesota, 1912-1928*, by Fred J. Engelhardt and Henry J. Otto.
- Nursing Procedures*, by Marion L. Vannier and Barbara A. Thompson, with student rating scales.
- Minnesota Freight Rate Structure*, by Wayne E. Butterbaugh.
- The Day of the Cattleman*, by Ernest S. Osgood.
- Development and Growth of the External Dimensions of the Human Body in the Fetal Period*, by Richard E. Scammon and Leroy A. Calkins.
- Problems of Science Teaching at the College Level*, by A. W. Hurd. This is Volume I of a series of three entitled *The Teaching of Science at the College Level*, edited by E. M. Freeman.
- Topics in Psychology*, by M. E. Haggerty.
- Practice Exercises*, by L. J. Brueckner.
- The Measurement of Nervous Habits in Normal Children*, by Willard C. Olson.
- America in the Forties*, The Letters of Ole Munch Raeder, translated and edited by Gunnar J. Malmin, for the Norwegian American Historical Association.

Studies in English Philology, A Miscellany in Honor of Frederick Klaeber, edited by Kemp Malone and Martin B. Ruud.

Poets and Playwrights: Shakespeare and Jonson, Spenser and Milton, by Elmer Edgar Stoll.

Curricular Problems in Science, by Palmer O. Johnson. Volume II of *The Teaching of Science at the College Level*.

The Background of Swedish Emigration to the United States, by John Lindberg.

The Small City and Town, edited by R. S. Vaile.

Factors Other Than Intelligence Affecting Success in High School, by Austin Turney.

The Language Development of the Preschool Child, by Dorothea A. McCarthy.

Problem Tendencies in Children, by Willard C. Olson.

The Professional Education of High School Teachers, by W. E. Peik.

Minnesota Mechanical Ability Tests, by members of the Psychology Department.

The Eighteenth Century Background of Hume's Empiricism, by Mary S. Kuypers.

The Measurement of Man, Minnesota Sigma Xi Lectures, by J. Arthur Harris, C. M. Jackson, D. G. Paterson, and R. E. Scammon.

Laboratory Instruction in the Field of Inorganic Chemistry, by Victor Noll. Volume III of *The Teaching of Science at the College Level*.

Respectfully submitted,

MARGARET S. HARDING, *Editor*

TEN YEARS ACTIVITY IN THE FIELDS OF
SCIENTIFIC RESEARCH AT THE UNIVERSITY OF
MINNESOTA

TEN YEARS ACTIVITY IN THE FIELDS OF SCIENTIFIC RESEARCH AT THE UNIVERSITY OF MINNESOTA

Scientific research is conducted at the University of Minnesota as a part of a planned effort to draw from the University the maximum possible contribution toward the improvement of life in Minnesota and, of course, incidentally in some cases over much wider areas. Pushing back the horizon of man's knowledge and uncovering new treasures of scientific principle frequently must go on along a wide front in order to make possible the achievement of an outstanding and brilliantly practical result at some one given point. Under every tower of recognizable research achievement there must be a broad and firm foundation.

Furthermore, the efforts of any one group of scholars to cope with the problems challenging their capacities in most instances involve the sort of results whose ultimate value to society can be measured only after the lapse of considerable time. In the midst of the creative effort it is difficult for those responsible for any type of creation to judge the results of that effort with objective impartiality and with sound perspective. The record of the last ten years is one which is here submitted without any attempt at this time to indicate which of the many studies can be regarded as the ones of greatest permanent value. We must stand more than ten years away from most of these efforts before we undertake to make a final classification but it is significant that in all the range of scientific effort men serving the University have been determined to do more than merely focus and pass on the accumulated experience of others and that men so determined have had the ability to do things recorded on the following pages.

The list of activities given on the pages immediately following is an evidence of some of the types of undertakings going on in all divisions of the University during the past ten years. It already is clear that some of the studies here recorded are unique in their character and of really great value in their direct application to current problems in the state of Minnesota. Research at the University of Minnesota necessarily is undertaken with the con-

stant ultimate objective of usefulness to the community supporting the University; but during the past ten years the repeated use in the most practical way of earlier researches which in their first stages were regarded as purely theoretical and of limited practical value, justifies a real and continuing faith in those lines of pure research which so repeatedly have proven to be the indispensable ground work for the more readily understandable applied research.

A glance through the reports given on the next few pages will bring to mind again the wide multiplicity of demands made upon this University by the citizens whom we serve. In many fields, all over the world, seekers for a better understanding of man and his environment attribute much of the progress they have made to the trail blazing of Minnesota scientific pioneers.

The record of what has been done is a promise of still greater achievement in the years to come—so long as an understanding of the importance of this work can govern the provision of essential financial support.

The list of publications of the faculties, for a two-year period, issued as a special supplement to this report, supports a belief in the impossibility of listing adequately even the more notable research achievements at the University during the ten-year period from 1920 to 1930.

SUMMARY OF RESEARCH IN THE DEPARTMENT OF AGRICULTURE

BUTTER COMPOSITION

Investigations from 1921 to 1926 under the leadership of C. H. Eckles and Willes B. Combs of the Division of Dairy Husbandry showed that butter factories were experiencing unnecessarily large losses because of a failure to standardize their product. As a result of the activities of the Dairy Division, methods of control were installed, which, according to the public statement of a representative of a marketing organization, resulted in a saving of \$625,000 in one year for the product handled by this one organization. The procedure in question has been generally followed by

Minnesota creameries for the last few years with equal savings each year.

MOLD IN BUTTER

Losses from mold have occurred ever since butter became a market commodity. Investigations under the leadership of Dr. Macy and Professor Combs of the Division of Dairy Husbandry showed for the first time the real source of the trouble and devised successful methods for its elimination. Losses to the dairy industry of many thousands of dollars annually have been almost entirely eliminated.

TREATMENT FOR MILK FEVER

Milk fever has for many years been a serious disease among valuable dairy cattle. The cause was a complete mystery and the treatment purely empirical although fairly satisfactory. Research work by Dr. Petersen of the Division of Dairy Husbandry and Dr. Boyd of the Division of Veterinary Medicine made clear the cause of the disease and suggested a new treatment which relieves the trouble immediately in practically every case. The treatment is already in general use by the veterinary profession.

A NEW METHOD OF DETERMINING THE FAT IN BUTTERMILK

For about forty years the question of the proper procedure for finding the amount of fat in buttermilk at the time of churning has been a matter of uncertainty. The cause for the widely divergent results was determined by Dr. Thurston and Dr. Peterson of the Dairy Division and a new method devised which for the first time makes it possible for the butter manufacturers to determine the actual fat losses in making butter.

PHOSPHORUS DEFICIENCIES

Ever since the first settlers arrived in certain parts of western Minnesota a serious trouble has been experienced with livestock, especially cattle. As the result of a research project conducted under the leadership of Dr. Eckles of the Division of Dairy Husbandry and Dr. Palmer of the Division of Biochemistry the cause of the trouble has been found to be shortage of phosphorus in the feed of the animals resulting from a deficiency of this element in the soil.

Dairy animals suffering from a shortage of phosphorus produce not over half the normal amount of milk, and beef animals

are in poor condition for market. Supplying the deficient phosphorus by means of bonemeal reduces the feed required by the animals about one fifth. The possible saving of feed by making up the phosphorus deficiency in the twenty counties affected more or less, is estimated at approximately \$750,000 per year.

Due to the wide-spread dissemination of the experimental results, indications are that the conditions have already been corrected on a majority of the farms affected.

The crop improvement work of the Division of Agronomy and Plant Genetics had led to the production and introduction of many improved varieties which are widely grown by Minnesota farmers. In co-operation with the Division of Plant Pathology and Botany the problem of disease resistance has been studied extensively, and many of the new varieties introduced are resistant to certain destructive plant diseases, which previously caused heavy losses when susceptible varieties were grown.

Minturki winter wheat has spread rapidly throughout southern Minnesota and in recent years approximately 150,000 acres have been grown each year. This is more than three times the acreage grown in 1912. Minturki is much more winter hardy than any variety of wheat previously available and is practically the only variety grown in southern Minnesota. It yields high and is resistant to bunt and stem rust.

In spring wheat the stem rust resistance of durum was combined with the bread wheat qualities of common wheat by a cross of Tumillo durum with Marquis. Marquillo produced from the cross is stem rust resistant and yields well. In the hands of farmers it gave a good account for itself during the seasons of 1929 and 1930.

Barley has increased greatly as a feed crop. Smooth awned varieties are much easier to handle and the new smooth awned varieties Velvet and Glabron are being widely grown in Minnesota. These were produced from a cross of an undesirable smooth awned variety with Manchuria, the standard rough awned sort previously grown.

Gopher oats proved very popular on heavy lands in southern Minnesota because of its stiff straw and heavy yielding ability. They were obtained from a plant selection in a 60-day variety. Anthony and Minrus oats were obtained from crosses of White Russian with Victory and Minota respectively. They combine

the stem rust resistance of their White Russian parent with the desirable agronomic characters of Victory and Minota.

The newer methods of corn breeding by means of controlled pollination have been studied extensively. Three double crosses were distributed for the first time in 1930. Each plant of such a cross produced a good ear, resulting in increased yields and uniformity of maturity, which are important features in corn production. These crosses have created a very favorable impression among the corn growers of Minnesota. Minnesota is one of the first experiment stations to introduce double crosses for commercial corn production.

These research studies in crop improvement have an international reputation which is attested by the graduate students from foreign countries who have majored in the Division of Agronomy and Plant Genetics. The foreign countries represented comprise Sweden, Norway, Belgium, Denmark, Bulgaria, China, New Zealand, Australia, and Canada.

DIVISION OF HORTICULTURE

The value of inbreeding in the improvement of asexually propagated crops has been demonstrated by Dr. F. A. Krantz in the cultivated potato, *Solanum tuberosum*. Due to the difficulties involved in the improvement of this crop, no new varieties have entered into the commercial production of this crop for forty years or more. The utilization of the principle of inbreeding has been demonstrated after seven years of work at the Minnesota Agricultural Experiment Station to be a practicable method for the systematic improvement of this crop.

Two important developments are the direct result of this work. First, seedlings have been developed which promise to usher in a new era in potato production. Second, it has promoted a national program for the improvement of the potato crop. A number of states have initiated potato breeding work during the past year (1929-30). All the work has been co-ordinated through cooperative relations established the past year with the United States Department of Agriculture.

This fundamental and foundational breeding work has involved a number of genetic studies which have gained for Dr. Krantz world-wide recognition as the leading scientist in potato breeding in America.

CONTRIBUTIONS IN FRUIT BREEDING

During the ten-year period 1920-30, thirty-three new varieties of fruits, including two ornamental fruit plants, have been named and introduced by the division. Those which have been most favorably received are as follows:

Underwood plum, a large early maturing, hardy variety of good quality, has proven valuable both for home and commercial fruit growers. It is the most widely planted variety of plum grown in Minnesota. Other important varieties of plums are *Tonka*, *Red Wing*, *Monitor*, *Elliot*, and *La Crescent*. These have all been sold in large quantities by Minnesota nurserymen and are fruiting successfully throughout the state.

Zumbra and *Nicollet* (plum-cherry hybrids) are being grown to a considerable extent for home use, functioning as substitutes for the true cherry which is not adapted to Minnesota.

The Haralson apple, a productive hardy red winter variety, has met with especial favor and is beginning to be produced in commercial quantities. While definite information is lacking, it is believed that at least 100,000 trees of this variety are being grown in the orchards of Minnesota.

The Minnehaha June-bearing strawberry and the *Duluth ever-bearing strawberry* have been grown with conspicuous success in certain regions of Minnesota. Both of them have made important contributions to the commercial strawberry industry of the state. The *Duluth* has recently been recognized as the best strawberry for Colorado conditions and Colorado stations, which are recommending the *Duluth* most highly, believing that as soon as plants can be produced it will become the leading ever-bearing strawberry of that state.

The Latham raspberry has proven to be the most outstanding contribution of the Fruit Breeding Farm. To quote from an article prepared by one of the horticultural men of the New York Agricultural Experiment Station of Geneva, "Latham is the most talked of red raspberry in America." In Minnesota, it is planted almost exclusively except in the Hopkins district where an earlier berry has been desired. This year 7,000,000 plants will be produced and sold by Minnesota nurserymen. Most of these go to other states, particularly the middle west and eastern states. One nurseryman has nearly ninety acres given over to this raspberry with a view to disposing of the plants in the market. The wholesale value of this nursery stock for the current year will be about

\$140,000. Information is not available regarding the fruit, but it is a conservative estimate to say that \$1,000,000 worth of Latham raspberry fruit was produced this year in Minnesota.

A new raspberry, *Chief*, has been introduced within the past year (1929-30) which is superior to Latham in many respects, and which is so promising that nurserymen have already produced three quarters of a million plants to go on the market this fall and next spring. The wholesale price of this new variety is at present \$50 per thousand. Its superiority to the Latham lies in its greater hardiness, high quality, earlier ripening, and disease resistance.

Fundamental research in pomology other than fruit breeding has yielded a few noteworthy accomplishments. Among these are the hardiness studies of Dr. A. C. Hildreth and Dr. J. H. Beaumont which have contributed not only to an understanding of the fundamentals of winter killing, but have also given a practical, convenient method of determining relative hardiness of apple trees through simple dissection of certain parts of tip growth following any winter. This is of great importance in fruit breeding work since it provides an easy and rapid method of determining the probable hardiness of a new variety.

CONTROL OF PESTS

A problem of fundamental importance in pest control is that of being able to estimate accurately the possibilities of increase or the so-called "biotic potential" of an injurious organism. It is obvious that the abundance of numbers of such organisms is determined by the balance between their tendency to produce large numbers and those factors in the environment which check this potential increase. If accurate methods of determining the rôle of the various factors involved existed we would be able to apply them in a practical manner by predicting the time of appearance and severity of insect outbreaks, as well as the possibilities of extension of important pests into new areas.

To the present there has been developed no logical method of arriving at the abundance of forms in nature other than that of haphazard trial and error, in spite of the conviction of a few outstanding workers that it is possible to arrive at rather definite constants comparable to those which underlie modern physics and chemistry.

Dr. R. N. Chapman, viewing the problem in its broad aspects, has found that the Confused Flour Beetle (*Tribolium confusum*)

is an organism which can be reared under controlled conditions, in which the environmental factors can be reduced to a practical minimum. He has developed a relatively simple technique for laboratory investigations and has demonstrated that by the use of this technique it is possible to produce a population in equilibrium with its environment and with a constant number of individuals per gram of environment. The quantitative results are as consistent as those with which physicists are concerned in the study of physical systems.

By the method developed it will be possible to test experimentally the fundamental theorems of biotic associations which have been developed by the Italian mathematician Volterra and to broaden the work to make it applicable to all organisms. The work represents one of the most significant advances of a fundamental nature in its field. It offers to the worker on economic problems an approach of far-reaching possibilities.

CHECKING WHEAT RUST

The investigations of Dr. E. C. Stakman and his assistants in the physiologic races of black stem rust of wheat established firmly the constancy of a large number of such difficultly distinguishable forms, and the technique of these investigations has become a standard and almost universal method everywhere in the study of plant diseases. Furthermore, the results have made possible more exact methods of cereal breeding for resistance to rust. More recently this knowledge of physiologic forms indicates a possibly great value in the study of the dreaded spread of wheat rust from southern states into the spring wheat belt.

In recognition of his investigations, Dr. Stakman was awarded in May, 1928, the Emil Christian Hansen prize and gold medal (Copenhagen, Denmark) "in appreciation of the pioneer work accomplished by him in developing new ideas and methods for investigating the rust problem, methods applicable not only to the study of the wheat rusts but to the investigation of diseases due to the fungus parasites in general." He has been elected as foreign and honorary member of several European academies of science and scientific societies and has accepted an invitation to deliver a semester's series of lectures on plant pathology at the University of Halle in Germany for the coming year.

SUPPLEMENTING NATURE'S STOCK FOOD

The co-operative work of Dr. L. S. Palmer of the Division of Biochemistry and Dr. C. H. Eckles of the Dairy Division, first recognized that a considerable area of Minnesota was characterized by nutritional deficiencies of some sort, so that it was practically impossible to raise high-grade livestock in these areas—this is particularly true of a very considerable portion of the northwest section of Minnesota. The work which has been done at University Farm has demonstrated that the factor in question is due to mineral deficiencies and it has been found that supplementing the diet of the farm animals with steamed bonemeal will at least alleviate the condition and possibly effect a complete cure. These studies, which are still under way, have made possible profitable livestock growing in considerable areas of the state where livestock growing was certainly unprofitable before, and if the recommendations of Dr. Eckles and Dr. Palmer were utilized by the farmers in this area the money saving to the state would run into very large sums.

PROTEIN INVESTIGATIONS

In 1927, Dr. R. A. Gortner and Dr. W. F. Hoffman of the Division of Biochemistry, pursuing their protein investigations, secured evidence that the present system of protein classification used universally throughout chemical, medical, and physiological groups was misleading and based on entirely empirical grounds. Accordingly further investigations were undertaken as to the basis of the present system of protein classification, and in 1928, Dr. Gortner, Dr. Hoffman, and Mr. W. B. Sinclair published papers confirming the earlier suspicions and pointing out the misleading implications of the present system of protein classification. In these papers the authors emphasize the fact that one and the same protein may show very different physical properties under different physical environments, thus behaving as typical lyophilic colloid systems, and it is emphasized that too much reliance must not be placed on the physical properties of a protein under any one set of conditions as a means of characterizing that protein or predicting what its behavior would be under another set of conditions. Inasmuch as the major portion of the human body is comprised of proteins, the change in viewpoint which is necessitated by these observations must be regarded as a major contribution to physiology.

DEVELOPING WINTER-HARDY AND DROUGHT-RESISTANT PLANTS

The recognition of the place of "bound-water" as a factor in winter hardiness and drought resistance in plants was first suggested by Robert Newton, a graduate student, in work done in the biochemistry laboratories in 1922-23. Later Dr. William Robinson of the Division of Entomology found that similar relationships existed in so far as winter hardiness and drought resistance of insects are concerned, and more and more the freebound water relations are becoming generally recognized as a major factor in both plant and animal, including human, physiology.

RIPENING FRUITS AND VEGETABLES

Dr. R. B. Harvey of the Division of Plant Pathology and Botany discovered the use of ethylene gas in the ripening of fruits and vegetables. By this chemical method various kinds of fruits and vegetables may be artificially ripened, a process of tremendous value in the case of late domestic crops or of foreign and tropical fruits. This process, the patent for which Dr. Harvey donated to the University of Minnesota, has been used and applied to many crops not only in this country but in many foreign lands. His papers have been translated into many languages. Of even greater importance is the fact that the process offers extraordinary prospects for future applications.

SUMMARY OF RESEARCH IN THE COLLEGE OF SCIENCE,
LITERATURE, AND THE ARTS

THE DEPARTMENT OF ENGLISH

STOLL, ELMER E., Professor of English and Head of the Department of English

Shakespeare's studies, historical, and comparative in method.
New York: Macmillan. 1927.

Poets and playwrights: Shakespeare, Jonson, Spenser, Milton.
Minneapolis: University of Minnesota Press. 1930.

In these two books Mr. Stoll has presented critical studies of a very high order.

BEACH, JOSEPH W., Professor of English

The technique of Thomas Hardy. Chicago: University of Chicago Press. 1922.

This book has long since been recognized as authoritative in the field. It is the kind of study which involves not only an accurate knowledge of fact but a very keen, critical discernment.

RUUD, MARTIN B., Professor of English

Studies in English philology, a miscellany in honor of Frederick Klaeber, edited by Martin B. Ruud and Kemp Malone. Minneapolis: University of Minnesota Press. 1929.
Thomas Chaucer. Minneapolis: University of Minnesota Press. 1926.

The latter is a study of comparatively minor matter, but in some respects very valuable.

ATKINS, ELIZABETH, Assistant Professor of English

The poet's poet. Marshall Jones Company. 1922.

A book of literary criticism which has been received very favorably.

DUNN, WILLIAM P., Assistant Professor of English

Sir Thomas Browne: A Study in Religious Philosophy. Menasha, Wis.: George Banta Publishing Company. 1926.

Reviewed very favorably. The best study of its kind in connection with one of the most interesting figures in the history of English literature.

HILLHOUSE, JAMES T., Assistant Professor of English

The Grub-Street Journal. Duke University Press. 1928.

A piece of research which throws much light upon various problems of the eighteenth century.

PHELAN, ANNA A. VON HELMHOLTZ, Assistant Professor of English

The social philosophy of William Morris. Duke University Press. 1927.

A book in which the author shows that she has studied carefully not only William Morris but the other writers upon social theory in his time.

THE DEPARTMENT OF BOTANY

In 1929, after eighteen months of experimentation with rats, George O. Burr (with Mildred M. Burr) published a paper describing a new deficiency disease caused by the absence of fat from

the diet (*Journal of Biological Chemistry*, 82:345. 1929). The new disease manifests itself outwardly by scaly skin, necrosis of the tail, and some loss of hair. Often there is bloody urine. This has now been traced by Dr. C. N. Jackson to a peculiar degeneration of kidney tissue.

The animals are cured by the addition to the diet of only five to ten drops of lard or other common fat daily. These findings were important in that they overthrew the long accepted view that animals could synthesize all the fat they needed. It is now established that fats are essential constituents of the diet.

In 1930 Dr. G. O. Burr (with M. M. Burr) (*Journal of Biological Chemistry*, 86:587. 1930) established the fact that all fats are not of equal value. After studying those fatty acids known to occur in several common fats they concluded that none of the saturated fatty acids were required and that oleic acid probably was not an essential acid. But it was found that the more highly unsaturated linolic acid was a ready cure for the disease. Other acids such as linolenic are also effective as cures. A more detailed study of the individual acids is being made.

This work has brought on several interesting conclusions:

1. The so-called vitamin F of Evans and Burr was really fatty material in the natural food stuffs.
2. Leathe's theory of desaturation by the liver is only of limited application.
3. Active tissues break down when deprived of highly unsaturated fatty acids.

Contributions to Statistical Theory

The extension of interclass and intraclass correlation theory (originally due to Dr. J. A. Harris¹) to cover:

1. The fourfold table classification with results expressed in terms of the Pearsonian equivalent probability correlation coefficient.
2. Classification by attributes, the magnitude of association being expressed in terms of Pearson's bi-serial correlation coefficient.

These methods are of outstanding importance in that they per-

¹On the calculation of intra-class and inter-class coefficients of correlation from class moments when the number of possible combinations is large. *Biometrika* 9:446-72. 1913.

The determination of intra-class and inter-class equivalent probability coefficients of correlation. *Amer. Nat.* 64:115-41. 1930.

The extension of Pearson's bi-serial correlation method to intra-class and inter-class relationship. *Journal of Agricultural Research* (In press).

mit of the more detailed analysis of many kinds of data that previously proved too cumbersome for concise description. Now the associations may be readily measured upon the mentally comprehensible scale of the correlation coefficient.

Biological Investigations

The determination of the particular variables which fit the plant for growth under stringent or peculiar environmental conditions is a work of tremendous agricultural importance and biological interest. It must ultimately depend upon intrinsic morphological and physiological differences in the plants involved, and a working knowledge of these variables can only be secured from field investigations of native vegetations and agricultural crops. Dr. Harris has blazed the pioneer paths in these fields during the last decade. These works have embraced chemical and physico-chemical studies of the leaf tissue fluids of the native vegetation of the western deserts of the United States together with similar investigations of different varieties of Egyptian and Upland cotton, cultivated under both irrigation and dry-farming conditions. Thus many relationships of primary importance in these problems have been established. These involve the osmotic concentration of the tissue fluids, specific electrical conductivity, hydrogen ion concentration, chloride and sulphate content of both plant tissues and soil. The more important publications on this project are listed below:

1. The tissue fluids of Egyptian and Upland cottons and their F₁ hybrid. *Journal of Agricultural Research* 27:267-328. 1924.
2. The chloride content of the leaf-tissue fluids of Egyptian and Upland cotton. *Ibid.* 28:695-704. 1924.
3. Sulphate content of the leaf-tissue fluids of Egyptian and Upland cotton. *Ibid.* 31:653-61. 1925.
4. The leaf-tissue fluids of Egyptian cottons. *Ibid.* 31:1027-33. 1925.
5. The relationship between the concentration of the soil solution and the physicochemical properties of the leaf-tissue fluids of Egyptian and Upland cotton. *Ibid.* 32:605-47. 1926.
6. A possible relationship between soil salinity and stand in cotton. *Ibid.* 37:213-31. 1928.

THE DEPARTMENT OF ZOOLOGY

MINNICH, DWIGHT E., Professor of Zoology and Chairman of the Department of Zoology

Researches on the behavior of lower animals with special reference to insects. Specifically the work has led to the discovery

of important sense organs and an understanding of their functions. More generally the work has had the following results:

It has afforded a more comprehensive understanding of the insect mind.

It has furnished data which are important to the understanding of basic physiologic problems.

It has permitted the development of a technique which may be used in the study of a wide variety of problems.

RILEY, WILLIAM A., Professor of Entomology and Chief of the Division of Entomology and Economic Zoology
 Direction of important researches on parasites with particular reference to animals of economic importance and of man.
 Studies of parasites of fish in co-operation with Game and Fish Commission of Minnesota.
 Studies of parasites of fur-bearing animals in co-operation with Minnesota fur farmers.
 Studies of parasitic amoebae of man in co-operation with United States Veterans' Hospital.
 Studies of hookworm as a member of Rockefeller Foundation Commission to Porto Rico and to Central America.

DOWNEY, HAL, Professor of Anatomy
 Development of the blood-forming organs and the origin of the first blood cells of the embryo.
 Origin and relationships of blood cells in the adult.
 Study of blood diseases, especially anemia and leukemia, in an attempt to determine their origin, and to provide satisfactory means of classification and diagnosis.

A great variety of normal and pathologic human material has been used in these investigations, and animal material has been studied for comparison.

LUND, ELMER J., Associate Professor of Animal Biology
 Studies of the effect of electric currents on growth and regeneration. The results constitute a very important contribution to our knowledge of such fundamental problems of physiology as bioelectric currents and determination of organic polarity.

RINGOEN, ADOLPH R., Associate Professor of Zoology
 Researches on the origin, development, structure, function, and interrelations of the various types of white blood cells, and on the vascular pattern of bone marrow and the origin and de-

velopment of the island-like masses of cells in experimental boné marrow. The results are important in their relation to the general problem of the origin and development of blood under experimental as well as normal conditions.

THE DEPARTMENT OF PSYCHOLOGY

Experimental Studies of the Mechanism of the Brain in Relation to Learning and Intelligence

Dr. K. S. Lashley, for a decade a member of the University of Minnesota, now of the University of Chicago, has been authoritatively referred to as "probably the most eminent American worker in the field of physiological psychology." This distinction, which is largely the result of work done in our laboratories, is based on his discovery, with its far-reaching implications for human psychology, that the learning and retention of an animal's habits cannot be explained in terms of fixed nervous pathways or definite brain structures. The brain, more than has been universally believed hitherto, functions as a whole in learning, a conclusion supported by clinical evidence showing that one part of the brain may function as a substitute for another region of the brain which has been destroyed by injury or disease.

The Minnesota Investigation of Mechanical Ability

Grants from the National Research Council of over thirty thousand dollars permitted the most extensive investigation of mechanical ability which has ever been undertaken.

The investigators found that mechanical ability was a unique trait, not depending on abstract intelligence, motor agility, or physical strength, and that it was also practically independent of such factors as sex and environment. Girls who were given the tests were in only one instance markedly inferior to boys. Children who lacked the intelligence necessary for mental work were in many cases shown to possess superior mechanical ability.

The chief importance of these tests of mechanical ability is their far-reaching application to vocational selection and training.

The report of this investigation is found in *Minnesota Mechanical Ability Tests*, University of Minnesota Press, 1930, (p. 586). The research was directed by Donald G. Paterson and Richard M. Elliott. L. Dewey Anderson acted as chief investigator, Herbert A. Toops as statistical consultant, and Edna Heidbreder as editor of the report.

Studies of the Influence of Typographical Factors on Speed of Reading

Professor Donald G. Paterson and Professor Miles A. Tinker have undertaken studies, which in the last three years have revealed the need for radical changes in printing practice. The legibility of the ordinary printed page is proved by them not to be the most effective for efficient reading. Experimental tests have not confirmed the rules laid down in printing manuals.

These tests have determined the *optimum* length of printed line for each size of type and have proved that both size of type and line length must be properly balanced to yield the best results. Detailed specifications for maximum legibility are being made available to the printing industry as each additional study is completed.

It is now possible to answer inquiries from publishers and printers on the size of type, length of line, proper amount of spacing between lines, most legible styles or kinds of type, most legible combinations of colored ink and background, etc.

The United Typothetae of America (international association of master printers) exhibited the test materials and results of the seven studies already completed at their 1930 annual convention.

THE DEPARTMENT OF GEOLOGY

As to the quality of the research done by the staff a statement by Dr. Waldemar Lindgren, chairman of the Committee on the Processes of Ore Deposition of the National Research Council of the United States is quoted here. This committee made an investigation of the work done in various geological departments of educational and research institutions of the United States and Canada, and Dr. Lindgren's report was published in 1928. He lists the departments making notable contributions, and comments upon them as follows:

Among the institutions contributing are the Universities of Minnesota, Wisconsin, California, Yale, Harvard, Princeton, Stanford and the Massachusetts Institute of Technology; the Universities of British Columbia, Toronto, and McGill, and the Mining Schools of Missouri and Colorado. . . . Two stand out prominently as leaders: the University of Minnesota and the University of Toronto. In both the research seems better organized than elsewhere.¹

¹Lindgren, W. Research in processes of ore deposition. *Transactions of the American Institute of Mining Engineers*, New York meeting, 1928.

The contributions of the Department of Geology for the past ten years may be stated in six groups:

1. The investigation of mineral resources of Minnesota.
2. The mapping of the geology of large areas.
3. The revision of the geologic map of Minnesota.
4. Contributions to the study of minerals, based on laboratory work.
5. The development of generalizations on the origin of rocks and of ore deposits, based upon world wide studies.
6. The preparation of numerous bulletins of the State Geologic Survey and the preparation of monographs and textbooks on various phases of geology.

For the past ten years Dr. Frank F. Grout has been engaged in the study of the large granite areas of the world and has made valuable contributions on the age relations of granites as determined by the content of radioactive materials in the granite. He has served actively on a committee of the National Research Council for the study of these granite bodies and is now chairman of this committee. One of the outstanding contributions of the committee is a detailed statement of the present knowledge and research problems connected with granite masses. He has organized a laboratory for the study of igneous rocks which is supported by a grant from the Rockefeller Foundation. Dr. Grout has also prepared charts showing the method of differentiation of igneous rocks of the earth, and has made valuable contributions on the problem of the formation of igneous rocks. His detailed study of the Snowbank Lake (Minnesota) mass by application of recently developed criteria has led to the discovery that this mass extends downward. It is the only mass of this type known.

For the past ten years Dr. W. H. Emmons has been engaged in the study of the origin of the ore deposits of the world, particularly with reference to their associations with the once molten rocks that supplied the waters that deposited the ores. As a result of this work contributions have been made concerning the genesis of many of the mineral deposits of the world and a new classification of mineral deposits has been proposed. This classification embraces all lode ores and is being used by certain investigators in essentially all of the continents, where it has served in the prospecting and development of mineral-bearing areas. His detailed studies of the ore deposits of the Mississippi Valley have shown that these deposits are probably connected with the rise of molten rocks.

In many areas throughout the earth the deposits of different metals are arranged in standard zones about the areas of once molten rocks. Other areas do not show this zonal arrangement. These studies have shown that the latter are located far above the once molten masses or far below their tops.

Dr. C. R. Stauffer has discovered a very high grade limestone in the Devonian strata of Minnesota. This limestone is now being used for pharmaceutical and other purposes. A limestone in the Prosser or Lower Galena formation, Minnesota, suited to the manufacture of Portland cement was discovered also by Dr. Stauffer. Dr. Stauffer discovered fossils in the Red Clastic series which show that this extensive group of rocks which was once supposed to be of pre-Cambrian age, is really Upper Cambrian. He discovered also a fauna of well-preserved graptolites in the Cambrian at Afton, Minnesota, which was not formerly known, and he discovered the first conodonts or primitive fishes to be found in Minnesota. In 1929 he discovered a rich Middle Devonian fauna of European origin in California. He has established the correlation of the Upper Devonian of Iowa with the Pinal Creek section of Arizona.

During the last three years Dr. John W. Gruner has developed a new theory of the oxidation and leaching of iron formations in general, and those of the Lake Superior region in particular. This theory is based upon a large number of experiments at high temperatures and high pressures and also upon extensive field work. He has shown that the iron ore deposits of the Lake Superior type may be due to the dissociation of thermal waters at high temperatures and therefore may be expected to extend to great depths under favorable conditions. His investigations are still in progress. They are supported in part by a grant from the United States Steel Corporation.

One of the results of the work of Dr. Gruner on the iron ore formations of Minnesota (1922-24) was the discovery of fossil algae and iron bacteria in pre-Cambrian formations. These organisms are probably the oldest known fossils thus far discovered.

Dr. G. M. Schwartz has made important contributions on the genesis of ores and minerals and has found proof of the formation of various intergrowths of ore minerals by the breakdown of solid solutions, with important inferences as to temperature and other conditions of formation.

Dr. G. A. Thiel has made valuable contributions on the influ-

ence of natural gas in the accumulation of petroleum, and has shown that the migration of oil very commonly depends upon the presence of gas in the reservoir. He has developed a new series of tests for the identification of opaque manganese minerals. He has also made valuable contributions on the importance of microorganisms as geologic agents in chemical denudation, in the enrichment of metallic ores, and in the deposition of sedimentary ores.

Francis J. Pettijohn, when a student in the Graduate School of the University of Minnesota, made valuable contributions on methods of mapping complicated structures, using particularly the imbrication of pebbles of ancient shores.

THE DEPARTMENT OF PHYSICS

ERIKSON, HENRY A., Professor of Physics and Head of the Department of Physics

Discovery of the initial positive air ion.

The ion was discovered by Mr. Erikson when he perfected a method which enabled him to study the ionic state within a small fraction of a second after the ions are formed by the ionizing agent, and gave additional information about ions and their actions.

MILLER, LOUALLEN F., Professor of Physics

Effect of moisture on the heat transmission in heat insulating materials.

Heat insulation in refrigeration suffered for many years, both in efficiency in preserving low temperatures as well as to complete decay of the insulating wall. The above research furnished a quantitative measure of moisture effects. There is a marked difference in the decrease of insulation for conditions obtained during moisture states below saturation and that obtained at saturation. It showed the decided advantage to be gained if insulating walls could be hermetically sealed from moisture absorption. This work has shown considerable economic significance.

TATE, JOHN T., Professor of Physics

Excitation of spectra by positive ion impact.

The atoms of the chemical elements are excited to the emission of spectra by striking them with electrons. The possibility of exciting them by striking them with positive ions was for a long time a moot question. Dr. Tate has succeeded in studying spectra excited by positive ions of mercury and sodium. The results show that the efficiency of the process is very much less than for electron bombardment and that it is dependent largely on the velocities of the ions and not on their mass.

BUCHTA, J. WILLIAM, Associate Professor of Physics
A low voltage electron beam.

In studying the passage of electrons through mercury vapor, a sharply defined electron beam was discovered which could be produced at voltages of one-tenth the values ordinarily used in electron beam oscillographs.

VALASEK, JOSEPH, Associate Professor of Physics
Study of X-ray spectra

Using a specially constructed X-ray spectroscopie of high resolving power, the widths and structures of X-ray spectrum lines of the K series emitted by iron, nickel, cobalt, copper, molybdenum, and silver were studied. The lines were found to be very homogenous and of very narrow wave-length range.

LOZIER, WILLIAM W., Teaching Assistant in Physics
The nature of interatomic forces.

The new quantum mechanics predicts that forces which bind atoms together into molecules depend in a discontinuous manner on the symmetry relationships between the atoms. Mr. W. W. Lozier, by a method suggested by Dr. Tate, has demonstrated that it is possible by electron impact to put the molecules of hydrogen, nitrogen, and water vapor into states in which they spontaneously dissociate and release considerable energy. The quantitative study of the phenomenon completely verifies the predictions of the new quantum mechanics.

BLEAKNEY, WALKER, National Research Council Fellow
Multiple ionization of atoms by electron impact.

The classical picture of the electron as a minute mass particle would lead to the conclusion that the simultaneous removal of two or more electrons from an atom by the single impact of another electron would be an extremely rare occurrence. Dr. Walker Bleakney, using a method suggested by Dr. Tate, has shown that it is possible to remove as many as five electrons from the mercury atom at one impact. He has measured the energy the electron must have in order to do this and also the efficiency of the process. The results confirm the modern view that the electron is not merely a tiny mass particle but that its sphere of influence extends over a considerable region.

JONES, TOM, Commonwealth Fellow, and SMITH, PHILIP T.,
Teaching Assistant in Physics
Efficiency of ionization of gases by electron impact.

One of the most important processes involved in electric arcs and in vacuum tube discharges is the ionization of the gases by electron

impacts. Using a method suggested by Dr. Tate, Mr. Tom Jones and Mr. Philip T. Smith have measured the variation of the ionization in various gases with the velocity of the electrons. Mr. Smith has extended the measurements to 5,000 volts where his results may be made to join on to the results for the ionization produced by Beta particles from radioactive sources. Mr. Smith has discovered a number of irregularities in the ionization which may have a far-reaching theoretical significance.

SUMMARY OF RESEARCH IN THE FIELD OF THE SOCIAL
SCIENCES CONDUCTED BY THE COLLEGE OF
SCIENCE, LITERATURE, AND THE ARTS
AND THE SCHOOL OF BUSINESS
ADMINISTRATION

Postwar changes have given rise to new industrial and social situations and these in turn have been paralleled by the rise of research in the social sciences.

The character of research work and hence the form of scientific achievement in the fields of the social sciences requires special description because these fields of research have not been adequately explained to the public.

Perhaps the outstanding characteristic of scientific achievement in the social sciences today is the trend toward co-operative research carried on by organized groups of scholars in the utilization of large masses of data. Individual effort is still productive of important contributions and will no doubt always be but the trend is towards collaborative activity.

Projects which illustrate scientific achievement in the social sciences in which Minnesota scholars have participated may be noted in the following groups:

A. Large co-operative projects which involve the collaboration of national and international groups of scholars.

B. Projects designed to perfect the tools of research.

C. Descriptive studies.

The two latter may be co-operative or individual research.

A. Large co-operative research projects which involve the collaboration of regional, national, and international groups of scholars and in which University of Minnesota social scientists have participated or assumed scholarly leadership are:

American secretaries of state and their diplomacy. (New York: Knopf. 1927-1929: 10 volumes)

Under the auspices of a group of American scholars, with an editorial board of distinguished students of history, and under the managing editorship of Samuel Flagg Bemis of Washington University, this co-operative work was mapped out to give an account of American diplomacy as seen through the activities of the various secretaries of state. Historical scholars from all over the country contributed to the work after researches into material which, in many cases, had never been used before. Among the contributors was L. B. Shippee, of the University of Minnesota.

Bibliography of American travel.

Several years ago the American Historical Association outlined this project and appointed a committee to undertake the work; Dr. S. J. Buck, who had previously compiled a *Bibliography of Travel in Illinois*, was made chairman of the committee. The compilation of material and preparing it for publication is being carried on under Dr. Buck's direction and with the facilities of the Minnesota Historical Society. When this work is completed, and this will be fairly soon now, it will be of great value to workers in all the fields of the social sciences, giving, as it will, information as to where can be found contemporary accounts of various aspects of American society from the earliest times to 1900.

Bibliography of Minnesota newspapers and inventory of files.

Under the direction of Dr. S. J. Buck and in part subsidized by the Graduate School of the University of Minnesota competent workers have been working on and have nearly completed a bibliography of Minnesota newspapers and have located and inventoried files of same.

The dictionary of American biography, Vols. I-V, issued from 1928 to 1930.

This vast project is under the auspices of the American Council of Learned Societies. The following members of the faculty have contributed articles: T. C. Blegen, associate professor of history; Solon J. Buck, professor of history; Lester B. Shippee, professor of history and chairman of the Department of History.

The encyclopedia of the social sciences, Vols. I and II, 1930.

A vast project under the auspices of ten learned societies of the United States. The following members of the faculty of the University of Minnesota are contributors of articles: William Anderson, professor of political science and chairman of the Department of Political Science; Roy G. Blakey, professor of economics; Solon J. Buck, professor of history; Max S. Handman, professor of sociology;

Wilson D. Wallis, professor of anthropology, and sociology; and Malcolm M. Willey, professor of sociology.

Handbooks on research methods and procedure in agricultural economics. Two volumes mimeographed. August, 1928.

These handbooks were prepared under the direction of the Advisory Committee on Economics and Social Research in Agriculture of the Social Science Research Council. They were prepared for the purpose of assisting in the development of research methods in agricultural economics. A number of individuals contributed material for these handbooks. Among the members of the Division of Agricultural Economics, University of Minnesota, who had a part in this project were W. C. Waite, Dorothea Kittredge, A. G. Black, H. B. Price, and Budd Holt.

Materials for research in history.

A committee appointed by the American Historical Association to study the problem of collecting, preserving, and making available for use materials for research in history in the United States is headed by Dr. S. J. Buck, of the University of Minnesota. This committee has had several meetings and will be able to present at the next annual meeting of the association the preliminary results of its consultations.

The Central Northwest Regional Survey Committee is the nearest approach to a social science research council that we have upon our campus. It is the objective of the committee not to force all social sciences or all research workers in these fields at Minnesota to collaborate on a single project, but rather to supplement the work of individuals engaged in research by providing them with means for co-operative work upon the problems that present themselves in this area of the country. We do not look upon the Central Northwest region as in every way a unique area, but rather think of it as (a) unique or distinctive in some particulars and (b) typical of conditions throughout the United States in other particulars. Problems studied in this region must therefore be considered from two points of view. On the one hand we study them to portray to the scientific world generally the special problems of the region and the peculiar conditions that here exist; and on the other hand, we here study at first hand certain national problems as they appear to us in this region.

The first work undertaken by the Committee was the preparation of a preliminary bibliography dealing with geological, geographical, economic, political, social, educational, and historical problems of the Northwest region. This bibliography has been of considerable assistance to a number of research workers already.

The first distinctly co-operative work undertaken by the committee was the preparation of an atlas covering the major geological, geographical, economic, and social facts in this area. This work has been completed, covering the data through the census of 1920, but has not been published, due to the desire of the committee to have the work up to date through the census of 1930 when published. Other difficulties also have temporarily postponed the publication.

Other enterprises which the committee has fostered or assisted are several studies involving transportation of the Northwest; the beginning of a study of the problems of consumers and retailers in this area; a study of land utilization, on which we have a special committee; and others which need not be mentioned here.

Incidental by-products of this joint attack of the social science departments on problems relating to this region have been several summer conferences, one of which, held in the summer of 1929, dealt with the problems of the small town, and resulted in the publication of a very interesting work called, *The Small City and Town*, dealing with the problems of the small community in this area primarily.

Reports of scope and methods of research in agricultural economics.

A committee of the Social Science Research Council is at present supervising the preparation of reports on research in specific fields of agricultural economics. Detailed research projects are being outlined and suggestions for carrying on the work thereunder are being developed. A number of the members of the Division of Agricultural Economics are co-operating in this work including, O. B. Jesness, W. C. Waite, G. A. Pond, L. F. Carey, Dorothea Kittredge, and E. C. Johnson.

Investigation of social studies in the schools (under the auspices of the American Historical Association).

A study carried on during 1929-34 under the direction of Dr. A. C. Krey, professor of history. Dean Guy Stanton Ford is a member of the commission.

The consumer and changes in distribution of consumer goods (with special reference to the chain store).

There are several studies in progress in the School of Business Administration and in related divisions in the College of Science, Literature, and the Arts, which have recently been co-ordinated into one major research project.

The changes which have been taking place in recent years in the methods of distributing goods as evidenced in the rapid development of chain stores, the introduction of retail stores by the mail order houses, the establishment of factory outlets to consumer markets, etc., have all had far-reaching effects upon the economic and social structure of our communities. It is time for a study and appraisal of these movements in

marketing methods and of their repercussions upon the life and customs of the people. Thus far the studies which have been made in this field have been undertaken from the viewpoint of some one of the interested groups. Efficiency studies have been conducted, for example, in the interest of the independent retailers and for certain of the chain stores. There have been some consumer studies primarily for the purpose of giving information to advertisers as a basis for tapping new fields of demand. There has not been any comprehensive study of the whole problem from the standpoint of the consumer as representing the broad social interests of the community.

The University of Minnesota is admirably equipped to undertake such a study. It has the facilities to draw upon for investigating all phases of the problem. Not only are the resources of the School of Business Administration available to investigate the technical problems of marketing, finance, and other questions involving a knowledge of intricacies of business organization and management, but there are also the other social science departments which have taken an interest in this project and have contributed materially to the studies which have already been undertaken. It will probably require from two to five years to complete this study.

AGRICULTURAL ECONOMICS

Specific Projects in Agricultural Economics Representative of Research Contributions of the Division of Agricultural Economics

(The following are mentioned as illustrative projects in Agricultural Economics at Minnesota. They do not constitute in any sense a complete inventory of the research work of the division.)

STUDIES IN THE COST OF PRODUCING FARM PRODUCTS

The Department of Agriculture, University of Minnesota, pioneered in the development of detailed studies of costs involved in the producing of farm products. Statistical routes for the obtaining of detailed farm records were originated here nearly thirty years ago and the methods developed have been used as guides at many other institutions. A number of bulletins have been published making available results of this research. Andrew Boss, Frank Peck, George Pond, and others have taken prominent parts in these studies.

STUDIES IN PRICES OF FARM PRODUCTS

An important research project in this field has been that relating the factors influencing the price of potatoes (see *Technical Bulletin* 10 and 29, Minnesota Experiment Station). This was among the earlier studies in the country which applied detailed

statistical analysis to price behavior in an agricultural market. It has aided in stimulating price research as well as having immediate practical significance in the actual selling of potatoes.

Factors influencing corn prices for Minnesota have been studied in detail. Margins for handling vegetables also have been analyzed. An index of farm income has been developed and a technical bulletin will be published embodying those results.

STUDIES IN THE MARKETING OF FARM PRODUCTS

A series of studies of local marketing units such as farmers' elevators, potato warehouses, and creameries have been made. These have contributed to the knowledge of the operating problems of such enterprises and have supplied data on factors in their operating efficiencies.

STUDIES IN TAXATION AS AFFECTING AGRICULTURE

A study of some of the tax problems of agriculture has been made. A significant phase of immediate practical importance is that relating to inequalities of assessments of property.

STUDIES IN LAND VALUATION

One study of a group of farms in a representative agricultural county of southern Minnesota, reported on in *Technical Bulletin 9*, "Sale Prices as a Basis for Farm Land Appraisal" by G. C. Haas, employed correlation analysis in determining the factors affecting land prices. Another study in co-operation with the Federal Bureau of Agricultural Economics has given consideration to the factors involved in the valuation of cut-over lands.

AGRICULTURAL CREDIT STUDIES

The credit machinery for agriculture in Minnesota has been studied. (See *Technical Bulletin 55*.) A study of foreclosed farms is being carried on at present and this is expected to develop important conclusions as to the factors involved in farm foreclosures.

DESCRIPTIVE STUDIES

Minnesota Experiment Station *Bulletin 211*, by J. D. Black and H. B. Price, "Cooperative Central Organization," is a valuable contribution to the material available on agricultural co-operation. It presents a description of representative organizations and analyzes the fundamental problems encountered.

Marketing of Farm Products, a volume edited by H. B. Price and published by the Minnesota Press, contains contributions from a number of individuals now or formerly connected with this division. It presents a description of the market organization for a number of products with particular reference to the Twin City markets.

BUSINESS AND ECONOMICS

Business Cycles

Research in the field of business cycles has been done by various members of the department. Three types of studies have been made: (I) Analytical and Quantitative Studies in the Theory of Business Cycles, (II) Quantitative Studies of Special Aspects of the Business Cycles, and (III) Statistical Studies of Price Movements. The following is a list of published material in each of these three fields.

I. Analytical and Quantitative Studies in the Theory of Business Cycles

HANSEN, ALVIN H., Professor of Economics

Cycles of prosperity and depression in the United States, Great Britain and Germany. A study of monthly data, 1902-1908, University of Wisconsin *Studies in the Social Sciences and History* No. 5. 1921. 112 pages.

Business cycle theory, its development and present status. New York: Ginn and Company. 1927. 218 pages.

Demand in relation to the business cycle. *American Economic Review* 14:13-16. 1924.

Prime costs in the business cycle. *Journal of Political Economy* 33: 1-14. 1924.

Karstens' interpretation of the Harvard business index. *Journal of the American Statistical Association*. September, 1927.

II. Quantitative Studies of Special Aspects of the Business Cycles

MUDGETT, BRUCE D., Professor of Economics

The course of profits during the war. *Annals of the American Academy of Political and Social Science* 89:148-56. 1920.

VAILE, ROLAND S., Professor of Marketing

The use of advertising during depression. *Harvard Business Review* 5, No. 3:322-30. 1927.

HANSEN, ALVIN H., Professor of Economics

The sequence in war prosperity and inflation. *Annals of the American Academy of Political and Social Science* 89:234-40. 1920.

The effect of price fluctuations on agriculture. *Journal of Political Economy* 33:196-216. 1925.

III. Statistical Studies of Price Movements

HANSEN, ALVIN H., Professor of Economics

Wholesale prices, 1801-1840. *Journal of the American Statistical Association*. Vol. 29. 1924.

Wholesale prices in the United States, 1801-1840. *Bulletin of the Bureau of Labor Statistics* 365:235-48. 1925.

Until these studies were made nothing definite was known about the movement of prices in the United States during the first quarter of the nineteenth century. These indices have since been widely reproduced in numerous books and periodicals.

Marketing and Market Prices

Contributions by the staff in the field of marketing and market prices are of two types: (I) those which present basic data or methods which are of value in subsequent studies, and (II) studies of specific market organizations or policies. The following are outstanding illustrations of these two types of contributions.

I. Basic Data and Methodology

HANSEN, ALVIN H., Professor of Economics

(See under Business Cycles above.)

WAITE, WARREN C., Professor of Agricultural Economics

Market price analysis. *Journal of Farm Economics* 6:351-59. 1924.

This sets up methods of price analysis which have been generally adopted by subsequent workers in the field.

II. Specific Studies

BOSLAND, CHELCIE C., Instructor in Economics

Forecasting and the price of wheat. *Journal of the American Statistical Association* 21:149-61. 1926.

CANOYER, HELEN G., Instructor in Economics

The importance of brands in merchandising policies (Unpublished). 1929.

NELSON, MILTON N., Instructor in Economics

Open price association, University of Illinois Press. 1922. 225 pages.

SLAGSVOLD, PETER L., Instructor in Economics

Development and present status of merchandising in the central north-west, with special reference to chain store development (Unpublished). 1930.

VAILE, ROLAND S., Professor of Marketing

Why and where youth buy shoes. *Shoe and Dry Goods Merchant* 1:24-25. 1926.

Some long-time effects of cooperative marketing. *Journal of Farm Economics* 9:82-93. 1927.

Advertising during depressions. *Harvard Business Review* 5:323-30. 1927.

Economics of advertising. Ronald Press. 1927. 196 pages.

General Economics

During the decennium just completed members of the staff have published three textbooks as part of an effort to give the beginning student in economics a new and more satisfactory approach to the study of complex economic problems; this approach to consist of (1) the factual background of production, marketing, and finance unified with a minimum body of principles and (2) the principles of value and distribution. For the approach courses two texts have been written; *Production Organization* by J. D. Black and A. G. Black, and *Market Organization* by R. S. Vaile and P. L. Slagsvold; for the principles course, *Principles of Economics* by F. B. Garver and A. H. Hansen.

Arthur Marget has ready for publication a theoretical study of the interest rate that emphasizes the *mechanism* of rate determination as an independent causative force. He has also ready for publication a theoretical study of the velocity of circulation of money.

Statistics

In statistics the need for improved texts for the use of students of economics and business has been met in part by the publication of *Statistical Tables and Graphs* by B. D. Mudgett. He has also written at the request of the Advisory Committee on Social and Economic Research in Agriculture of the Social Science Research Council, a study on the "construction of index numbers with applications to index numbers of farm prices."

Mr. R. L. Kozelka's study, "a business index for the central northwest," is a penetrating critical study of existing data on production and business activity in the Ninth Federal Reserve District.

Corporation Finance

The following studies have added materially to our knowledge of the activities of corporations. The corporation is one of the

most powerful instruments in the production and distribution of wealth. The data collected by these investigations is of great assistance to the student in two ways. They help us to understand business methods which is, in itself, a real contribution. Furthermore, the interpretation of these data by the authors and the use for further interpretation by others assist students of social problems to understand the effects of these modern production units upon the various groups of the community.

The following are the principal contributions in the field of corporation finance during the ten-year period:

STEHMAN, J. WARREN, Professor of Finance

The financial history of the American Telephone and Telegraph Company. New York: Houghton Mifflin Company. 1923. 275 pages.

BORAK, ARTHUR M., Assistant Professor of Economics

Financial history of the Chicago, Milwaukee and St. Paul Railway.

WEIDENHAMMER, ROBERT M., Assistant Professor of Economics

The economics of concerted action—a study of cartels and trade associations in the United States and Germany (Unpublished).

Labor

The research work of members of the Department of Economics in the field of labor may be divided into four fields: (I) Theoretical Studies, (II) Quantitative Studies in Occupational Trends, (III) Analytical and Quantitative Studies in Wages, and (IV) Surveys of Unemployment. The published materials are listed below.

I. Theoretical Studies

HANSEN, ALVIN H., Professor of Economics

Economics of unionism. *Journal of Political Economy*. 1922. Pages 518-30.

The technological interpretation of history. *Quarterly Journal of Economics* 36:72-83. 1921.

Cycles of strikes. *American Economic Review*. Vol. II. 1921.

II. Quantitative Studies in Occupational Trends

HANSEN, ALVIN H., Professor of Economics

Industrial class alignments in the United States. *Quarterly Publication of the American Statistical Association* 17:417-25. 1920.

Industrial classes in the United States in 1920. *Journal of the American Statistical Association* Vol. 18. 1922.

III. Analytical and Quantitative Studies in Wages

HANSEN, ALVIN H., Professor of Economics

The buying power of labor during the war. *Journal of the American Statistical Association* Vol. 18. 1921.

Factors affecting the trend of real wages. *American Economic Review* 15:27-42. 1925.

The outlook for wages and employment. *Ibid.* 13:27-44, supplement. 1923.

The best measure of real wages. *Ibid.*, pp. 5-16. March, 1926.

IV. Surveys of Unemployment

STEAD, WILLIAM H., Assistant Professor of Economics

Measuring a city's employment. *Survey*. November, 1929.

Extensive surveys have been made of the fluctuations in employment in every major industry and commercial group in the three cities, Minneapolis, St. Paul and Duluth. Monthly figures were obtained from the books of each firm from 1925 to the present. Continuing employment indices are being maintained by the School of Business Administration.

Regional Economic Studies

A number of studies have been conducted by members of the staff in Economics and Business Administration pertaining to the central northwest region. These are related closely to the work of the Regional Survey Committee. Several of the projects have received some recognition due to the fact that they contain significant contributions of worth while information. There is a wide range of subjects included in this class of studies of which the following are illustrative:

WAGNER, FREDERICK C., Associate Professor of Marketing

An economic survey of the trading area of Mankato, Minnesota. Published in the *Mankato Free Press*.

BUTTERBAUGH, WAYNE E., Lecturer in Transportation

The Minnesota freight-rate structure. Minneapolis: University of Minnesota Press. 1929.

KUHLMANN, CHARLES B., Instructor in Economics

The development of the flour-milling industry in the United States. New York: Houghton Mifflin Company.

VAILE, ROLAND S., Professor of Marketing

Economic effect of pollution of the Mississippi River. In *Report of the Minnesota State Department of Health*. 1929.

KOZELKA, RICHARD L., Instructor in Economics

Business index for the central northwest. Doctor's thesis. Materials to be published in 1931.

Public Finance

The studies in public finance by and under the direction of members of the staff may be classified into four groups.

I. Studies of the federal income tax which began prior to the decade beginning 1920 have continued to date. These have resulted in a series covering every federal income tax law from that of 1913 to the 1928 act, inclusive. These studies have all been published by the American Economic Association. One additional study has been completed on the federal income tax, the result of which was embodied in a paper given at the Fortieth Annual Meeting of the American Economic Association and published in the *Proceedings of the Association*. Furthermore, Professor R. G. Blakey spent one year in the Institute of Economics at Washington conducting a further study of federal income taxation which has not yet been completed.

II. A group of studies pertaining to federal debt policies has been completed. During the period of the World War, less extensive studies were made of the federal government tax and loan policies. These have been continued in a few studies of the post-war debt policies of the United States as compared with the policies following the Civil War and other wars.

III. Studies of the cost of state government in Minnesota and six nearby states made prior to the decade beginning 1920 have been followed by investigations of special state and municipal tax problems in Minnesota. Most of these latter studies have been by graduate students.

IV. Professor R. G. Blakey has been called to two other states to assist in or to direct extensive tax surveys. In the case of North Carolina, he served as a general consultant and also made a survey of the state income taxes in the United States followed by recommendations as to proper policies for North Carolina to pursue. In 1930 he was asked by the governor of West Virginia to make an investigation of the entire state and local tax system.

The report for the state is about ready for submission and publication.

Some of the studies referred to above are listed below:

I. Studies in Continuation of Federal Income Taxation

BLAKEY, ROY G., Professor of Economics

Revenue Act of 1921. *American Economic Review* 12:75-108. March, 1922.

Revenue Act of 1924. *Ibid.* 14:475-514. September, 1924.

Revenue Act of 1926. *Ibid.* 16:401-25. September, 1926.

Revenue Act of 1928. *Ibid.* 18:428-48. September, 1928.

Simplification of the Federal Income Tax, Papers and Proceedings of the Fortieth Annual Meeting of the American Economic Association. *Supplement of the American Economic Review* 18:102-19 March, 1928.

II. Studies in Public Debt Administration

BLAKEY, ROY G., Professor of Economics

Immediate refunding of the war debt. *Annalist* 17:366. 1921.

New government bond issue criticized. *Ibid.* 24:639, 650. 1924.

III. State Income Tax

BLAKEY, ROY G., Professor of Economics

The income tax (state). *Report of the Tax Commission of North Carolina*, 1928. Chapter XX, pages 535-86.

IV. Miscellaneous

BLAKEY, ROY G., Professor of Economics and BLAKEY, GLADYS C.

National Tax Association Digest and Index, New York, 1927. 519 pages.

THE DEPARTMENT OF HISTORY

To a considerable extent the work of the historian is that of the independent scholar; he keeps abreast of the literature in his subject and, at the same time by research in some particular period or on some special topic adds to the sum total of knowledge. It is not alone his own contributions which swell the volume of ascertained fact relating to the past and thus help interpret the present, but those of the younger men and women who work under his inspiration and guidance add their quota as well; the following illustrations, while not attempting to cover the whole ground of

what has been done by students of history at the University of Minnesota during the past ten years, show something of what has been going on.

Wallace Notestein, for many years professor of history at Minnesota before he went to Cornell and thence to Yale, had his principal field of interest in seventeenth century England, particularly in the period prior to and during the great Puritan Revolution. It was this interest which led him to build up the notable collection of books and pamphlets which make the University of Minnesota, in conjunction with the Minneapolis Atheneum, one of the two best places in the country for the study of this period. His editing of *The Journal of Sir Simonds D'Kwes from the Beginning of the Long Parliament to the Opening of the Trial of the Earl of Strafford* (Yale University Press, 1923) and of the *Commons Debates for 1629* (University of Minnesota, 1921) in collaboration with Miss Frances Relf, who took her doctorate at Minnesota in 1921, are examples of the productive scholarship of this interest. Dr. David Willson, who continued the exploitation of this field at Minnesota after Dr. Notestein left, was trained by the latter at Cornell University and is bringing out, through the University Press another significant contribution by critically editing *The Parliamentary Diary of Robert Bowyer, 1606-7*.

N. S. B. Gras, professor at Minnesota from 1918 to 1927, stands among the foremost in the country in the field of economic history. His *Introduction to Economic History* (New York: Crofts, 1925) is a synthesis of some of his work. While at Minnesota and before he went to Harvard, his many graduate students worked in the field of economic history and made decidedly worthwhile contributions to its literature. For example, Miss Mildred Hartsough, who received a Doctor's degree after working with Mr. Gras, published an expansion of her thesis under the title, *Development of the Twin Cities—Minneapolis and St. Paul—as a Metropolitan Center* (Research Publications of the University of Minnesota, *Social Science Series No. 18, 1926*), and Dr. Charles B. Kuhlmann, who is now professor of economics at Hamline University, worked out under Mr. Gras his *Development of the Flour-Milling Industry in the United States with Special Reference to the Industry in Minneapolis* (Boston: Houghton Mifflin Company, 1929).

S. J. Buck as professor of history at Minnesota and superin-

tendent of the Minnesota Historical Society, links two of the cultural institutions of this state. In the latter capacity he has charge of the collection, preservation, and making available the materials from which the story of Minnesota's past may be reconstructed. It was due in no small part to the assistance of Dr. Buck and the society that Dr. Folwell's notable four-volume *History of Minnesota*, one of the outstanding state histories of the country, saw the light in the form which it has taken. The University also had a hand in the completion of this work by helping, through the Graduate School, in the research by furnishing for several years the services of a competent graduate student. Dr. Buck's work, both at the Historical Society and at the University, shows in the achievements of students who have pursued their graduate studies under his direction.

One of these students, T. C. Blegen, was awarded a Doctor's degree in 1925; his thesis, *Norwegian Immigration Before the Civil War*, elaborated by the materials obtained by him during a year's residence in Norway, is about to be published. Dr. Blegen has been for several years assistant superintendent of the Minnesota Historical Society and at the same time professor and head of the history department of Hamline University and is now a part time member of the history staff at the University of Minnesota. As a university professor he has in turn been guiding students in the field of Minnesota history where already much of the necessary spade work is being done.

For many years Dr. Buck's interest in the history of Minnesota has broadened into one which embraces the whole West and particularly the Northwest; here he has particularly studied the period of British occupation which necessarily brought especial attention to the fur trade. Not only has the Historical Society built up a notable collection of materials on this subject, but Dr. Buck's students at the University have produced some of the pioneer studies which must be made before a composite picture can be drawn. Arthur Louis Tohill (Ph.D., Minnesota, 1926) for example, wrote his dissertation on *Robert Dixon, British Fur Trader on the Upper Mississippi; A Story of Trade, War and Diplomacy*, and Alice Elizabeth Smith (M.A., Minnesota, 1926) wrote on *The Fur Trade West of Lake Michigan, 1760-1796; A Study of the Trade Over the Fox-Wisconsin Route to the Region West*. A similar study, but in a later period, was that of

Anne Ratterman (M.A., Minnesota, 1927), *The Struggle for Monopoly of the Fur Trade*, which was written under the direction of L. B. Shippee.

G. M. Stephenson, who did a portion of his undergraduate work at Minnesota and advanced work at Chicago, has been a member of the history department for some thirteen years. His interest in immigration has led to the publication of *A History of American Immigration* (Boston: Ginn and Company, 1924), numerous periodical articles, and a *History of Swedish Immigration*, partly made possible by a year's sojourn in Sweden, which is now ready for the press. Dr. Stephenson has been especially interested in the development of religious organizations and has published several articles in this field besides guiding students in the study of special phases of this subject. One of these, J. O. Olson Anders, wrote his Doctor's thesis on *The Origin and History of Swedish Religious Organizations in Minnesota*, while others have taken up other aspects of this topic; for example, Mrs. Edith Abbetmeyer Selks produced for her Master's thesis in 1927 *The Beginnings of the German Lutheran Churches in Minnesota with a Sketch of Their Development*, and Olga W. Wold wrote a *History of the Augustana Synod, 1860-1870*.

A. B. White, during the nearly thirty years he has been a member of the university faculty, has devoted himself to the constitutional development of England with special emphasis on the medieval period; his *Making of the English Constitution* (New York: Putnam, 1925) is much more than a textbook, since it embodies the results of long research and is a standard authority on the subject. He has inspired graduate students to work in the same field and among them Miss Faith Thompson (Ph.D., Minnesota, 1923) whose study of *The First Century of Magna Carta: Why It Persisted as a Document* was printed by the University Press in 1925.

In the field of American diplomatic history, Dr. L. B. Shippee was the adviser of Mrs. Alice Felt Tyler (Ph.D., Minnesota, 1927) whose dissertation, *The Foreign Policy of James G. Blaine* (University of Minnesota Press, 1927) is an authoritative study of an interesting phase of our international relations. Other advanced students in this field have produced or are at work upon still other contributions to diplomatic history, some of them working at the same time under the guidance or with the co-operation

of Professor Harold S. Quigley who has made the Far East his own chosen field (see Political Science statement).

A. C. Krey, as a medievalist, devoted especial attention to the period of the Crusades, bringing out *The First Crusade* (Princeton University Press, 1921) and, in collaboration with George C. Sellery of Wisconsin, *Medieval Foundations of Western Civilization* (New York: Harpers, 1929) a textbook, but one of the most readable and illuminating works in this field. Dr. Krey's graduate students have delved into the details of the crusading era to formulate numerous monographs which make possible the broader and more comprehensive studies of medieval history.

Dean Guy Stanton Ford has found time, in the midst of his duties as chairman of the Department of History down to 1930, as dean of the Graduate School, and as conductor of the numerously attended course in the survey of modern European history, to write and publish *Stein and the Era of Reform in Prussia, 1807-1815* (Princeton University Press, 1922), a result of his special attention to Prussian history. Ernest S. Osgood, a comparatively recent member of the faculty, in his *Day of the Cattleman* (University of Minnesota Press, 1929) has written a pioneer book on the history of the high plains. Herbert Heaton, who was selected to continue the work in economic history after the resignation of Dr. Gras, in addition to pursuing his studies of the cloth trade, has not only written numerous articles on various aspects of economic history but guides many graduate students in this relatively new field of history. L. D. Steefel, who has just returned from a year's study in Europe where materials on the diplomacy of Bismarck were sought, is about to bring out his work on *The Schleswig-Holstein Question* (Harvard University Press).

For many years William Stearns Davis ministered to the needs of large classes of students in ancient history and at the same time was an indefatigable writer, producing not only works of a purely historical character but several in fiction form which carried the reader into the spirit of the times where his plot was laid. *The Beauty of the Purple* (New York: Macmillan, 1924) with its vivid picture of Constantinople in the time of Leo the Isaurian, *Gilman of Redford* (New York: Macmillan, 1927), a story laid in the days of the American Revolution, and *The Whirl-*

wind (New York: Macmillan, 1929) a tale of the French Revolution are but three of several titles, but serve to indicate the wide range of Dr. Davis' investigations. His resignation from Minnesota in 1927 deprived the University of a stimulating teacher and his death in 1930 removed a writer known widely throughout the nation by reason of his works.

THE DEPARTMENT OF POLITICAL SCIENCE

State and local government in Minnesota. Through the work done in the Bureau for Research in Government, and in the closely related Municipal Reference Bureau, of which Morris B. Lambie of this department has had charge since 1921, we have by joint effort succeeded in portraying the facts concerning the government of our state and localities in a more thorough way than has been possible, I believe, in any but a few states of the Union. The first work in a series was entitled, *A History of the Constitution of Minnesota* by William Anderson and A. J. Lobb. This was issued early in 1921 and was the result of a careful study into the origins and the development of the state constitution. I will not speak as to the quality of the work but will point out that a more complete history of a state constitution probably does not exist, and that in the course of the preparation of the work, the second of two originals of the constitution was uncovered, and that the true text of the constitution was for the first time verified and set forth in print. A work published in 1924, *The Constitution of Minnesota Annotated*, by Harold F. Kumm, completed the study of the constitution by setting forth a complete interpretation of it up to that time. These two works together constitute a rather important achievement in the description of the government of Minnesota.

The Bureau for Research in Government has carried forward the description of Minnesota government in a series of publications of which it is appropriate to mention: (1) *City Charter-Making in Minnesota*, a study of city government in the state, issued in 1929; (2) *The Law of Special Legislation and Municipal Home Rule in Minnesota*, a study which sets forth the constitutional position of cities in the state issued in 1923; (3) *Village Laws and Government in Minnesota*, issued in 1927; (4) *An Outline of County Government in Minnesota*, issued in 1928; (5) and *The Minneapolis City Charter, 1856-1925*, which is a history of

the Minneapolis city charter, issued in 1925. Our descriptive work in this field is by no means complete but will be carried forward in other studies.

Closely related to these works are others, such as Mr. Kumm's *The Law of Special Assessments in Minnesota*, published by the League of Minnesota Municipalities in 1927; an extensive series of pamphlet studies also issued by the League, and prepared under the general direction of Professor Lambie; and numerous articles and other contributions by Professor Lambie and others, published in the *National Municipal Review*, *Minnesota Municipalities*, and other publications. Special mention should be made of Professor Lambie's study of the *Administration of the State of Minnesota*, published by the League of Minnesota Municipalities in 1924, and the important *Minnesota Year Book* published by the League under his editorship in 1930. The latter work has already received favorable comment in other parts of the country and constitutes an excellent summary of much of the work which has been done in the two bureaus with reference to the government of Minnesota and its localities. We are not in position, of course, to evaluate our own work in this field, but we feel that our studies concerning state and local government in Minnesota constitute a fairly substantial achievement, since we find that a number of them have received nation-wide recognition, and that they have gotten into the literature of local government and are being cited and quoted by others.

In the study of local government and public administration more generally, attention might be called to a comprehensive work on *American City Government* which has received rather wide acceptance, and in which some new materials were presented and new relations shown. Other works in this broader field have consisted of monographic articles on the extra-territorial powers of cities, a subject which had not previously been developed in the literature of local government; several articles on the constitutionality of preferential voting and proportional representation, also a new problem; a study of tax exemption for municipal bonds, which was reprinted by a committee of the United States Senate for its own use; an article by Professor J. S. Young dealing with city planning and police power restrictions on private property; and various articles by Professor Lambie dealing with municipal leagues, and citizens' organizations in connection with

improvement of municipal government. Special note should be made of the study made by Professor Lambie of the British Civil Service, a study which was incorporated by the Federal Reclassification Board in its report to Congress, and which it printed at government expense.

In the field of constitutional law and government of the United States as a nation, past and present members of this department have made three outstanding contributions. In 1920, Professor R. E. Cushman published the first, and I might say the only, satisfactory monograph on the national police power. The frequent and repeated assertions of many lawyers and judges that the police power is reserved to the states was definitely modified by Professor Cushman's proof of the wide use of the police power by the national government. His work is still the authoritative monograph in this field.

In 1922, Professor Quincy Wright, of this department, published a monograph entitled, *The Control of American Foreign Relations* which is still the best work upon that subject. It is an analysis of the constitutional powers of the national authorities in the handling of foreign relations, and of the practices which have developed in the making and amendment of treaties.

Professor O. P. Field, now a member of this department, has during the past three years been making an unusually important contribution to the knowledge of constitutional law. It has been assumed by most persons that a legislative act which is declared unconstitutional by the courts is completely null, void, and of no effect. While he was still a graduate student here, Professor Field's attention was called to the fact that many such acts are in fact enforced by the courts even when held unconstitutional. He has carefully canvassed all the cases that he has been able to discover, and has published a series of six or eight articles in leading law reviews in which he has clearly demonstrated that a new type of law with a body of rules all its own has developed in the courts for giving more or less effect to unconstitutional statutes. The entire series of articles, together with certain general conclusions will be published in the course of this year under the title, "The Effect of an Unconstitutional Statute."

The government of the British Empire and the relations existing between the self-governing dominions and the home government was the special province of the late Professor C. D. Allin.

In a series of very careful monographs and articles, he developed very thoroughly the idea that the dominion governments have for years been practically independent from the home government in their management of foreign affairs, and it must be said that he was one of the first writers clearly to point out this fact. He also worked with great care upon the tariff relations existing between the various states in the Commonwealth of Australia and upon the development in the British Empire generally of preferential treatment for empire trade. His monograph, entitled, *Australasian Preferential Tariffs and Imperial Free Trade*, published, after his death, in 1929, summarizes much of his work in the field of tariff relations.

Upon his return from a long sojourn in China, Professor H. S. Quigley began in 1922 the publication of a series of articles dealing with the government, the politics, and the diplomacy of China and Japan. His work in this field has continued down to the present time and part of it will result this year in the publication of an extensive monograph on *The Government of Japan*. Professor Quigley's work in the field of Far Eastern relations has been so outstanding that it has brought him recognition not only in this country, where he stands as a leader in his knowledge of this field, but also in China and Japan where his works are carefully followed and arouse considerable comment. The exact nature of his contribution is of course hard to describe, but it is none the less real and important.

Three men who have been connected with the department, of whom one is still with us, have made important contributions to the study of international law, international relations, and international organization. Professor Allin and Professor Wright during their time in the department made outstanding contributions to the study of international law. Professor Quigley has contributed partly to the field of international law but also to some extent to the field of international relations and organization. His monograph entitled, *From Versailles to Locarno*, was an important study of the period ten years following the war. His articles in various periodicals dealing with international relations and the Far East are also worthy of mention.

It will be noted from the statements given above that the work of members of this department has not ranged the whole field of political science, but has been limited to certain definite fields

in which the men were more or less recognized specialists. One work of somewhat broader scope entitled, *A System of Classification for Political Science Collections*, was published by the Bureau for Research in Government as a contribution to library methods in our general field. As such it has been accepted and used in a number of places.

THE DEPARTMENT OF SOCIOLOGY

Research by Individuals and in Collaboration

CHAPIN, F. STUART, Professor of Sociology and Chairman of the Department of Sociology

Indexes of dependency. The project was to measure the fluctuations in poor relief in order to predict future trends and changes. The project was directed by Professor Chapin during 1923 to 1925 and much of the work was done by graduate students. The results were published as follows:

Seasonal variation of dependency. *Journal of the American Statistical Association* 18 (n.s.) No. 143:911-14. September, 1923.

A dependency index for Minneapolis. *Publications of the American Sociological Society* 19:200-202. 1925.

Dependency indexes for Minneapolis. *Social Forces* 5:215-24. 1926.

These studies developed a new method of analysis for sociological time series and have been widely quoted.

Measurement of participation in social activities. The project was to measure the intensity of a person's participation in the social activities of his community. The projects were directed by Professor Chapin and the work of the largest study was carried on by O. M. Mehus. The results were published as follows:

Leadership and group activity. *Journal of Applied Sociology* 8:141-45. January to February, 1924.

In this article the methods of research were outlined and working hypotheses formulated.

Extra-curricular activities of college students. *School and Society* 23:212-16. February, 1926.

Measuring the volume of social stimuli. *Social Forces* 4:479-95. March, 1926.

Extra-curricular activities at the University of Minnesota (with O. M. Mehus). Minneapolis: University of Minnesota Press. 1929. ix, 140 pages.

The child's enlarging social horizon. *Annals of the American Academy of Political and Social Sciences* 151:11-19. September, 1930.

Graduate students theses for M.A. degree

OLSON, C. L.—A study of the relation between religious education in the home and church activity and support among Latter Day Saints in Minnesota. June, 1928. 107 pages and appendices.

TAEUBER, C. F.—Group participation with reference to socio-economic status. June, 1929. 129 pages and appendices.

This group of studies developed a new method for the objective investigation of the individual's participation in social activities.

Measurement of socio-economic status and home environment. The project was to construct a scale to rate the home environment so that in scientific studies involving the family, it would be possible to substitute for the usual qualitative opinions of a "good" or a "bad" home environment, scientific measurement of the level of socio-economic status of the home. The results were published as follows:

A quantitative scale for rating the home and social environment of middle-class families in an urban community: a first approximation to the measurement of socio-economic status. *Journal of Educational Psychology* 19, No. 2:99-111. February, 1928.

The measurement of sociality and socio-economic status. *Sociology and Social Research* 12, No. 3:208-18. January to February, 1928.

A home rating scale. *Sociology and Social Research* 14, No. 1:10-17. September to October, 1929.

The meaning of measurement in sociology. *Publications of the American Sociological Society* 24, No. 2:83-94. May, 1930.

These studies represent one of the first attempts to provide an objective measure of home environment in place of subjective evaluative judgments, by measuring home environment in terms of socio-economic status. The average score and range of scores for middle class homes in such widely separated places as Baltimore, rural South Carolina, the Twin Cities, Pittsburgh, and boroughs of Brooklyn and Manhattan of New York City are similar, and correlations with intelligence of mother and of child are also similar. The scale is not yet as fully standardized as some of the more common scales for the measurement of intelligence, but its expanding use for measuring home environment by graduate students in different universities, by students in educational research and by research sociologists will supply the data for fuller standardization.

A theory of cultural change formulated on the basis of some fifteen years study and research and published in scattered articles and scientific papers which were brought together and written into a book: *Cultural Change*. New York: Century Co. 1928.

HANDMAN, MAX S., Professor of Sociology

The Mexicans in Texas.

Articles bearing on this study have appeared in the *Proceedings of the National Conference for Social Work*. 1926. Pages 332-39, and the *American Journal of Sociology*. January, 1930. Pages 601-11.

Mexican delinquency in the Southwest. Study made under the auspices of the President's Commission on Law Enforcement and Obedience.

An article to appear in the next issue of the *Proceedings of the National Conference for Social Work*.

Study on "The sociology of Pareto." In *Case Book of Scientific Method*. (In process of publication.)

The method of the social sciences. Article in *International Journal of Ethics* on "Scientific trends in economics."

WILLEY, MALCOLM M., Professor of Sociology

The study of the newspaper by quantitative methods: the project was to elaborate methods of precision in studying the modern press. The results were published in the *Country Newspaper*, pp. xii+153. University of North Carolina Press. 1926. The method was further developed by Julian Woodward, in *Foreign News in American Morning Newspapers*, p. 122. Columbia Press. 1930.

The President's Research Committee on Social Trends. A cooperative study under the direction of William F. Ogburn on social changes in the United States, 1900-1930, undertaken for President Hoover. In some respects parallel study to *Recent Economic Changes*. In conjunction with Stuart A. Rice, Mr. Willey is to do the research on communication. In all, about twenty investigators will be employed.

KIRKPATRICK, CLIFFORD, Associate Professor of Sociology

Comparative intelligence of children of certain races or nationalities in the United States. The project was to investigate the comparative intelligence of American, Finnish, French-Canadian, and Italian children with reference to environmental influences upon test scores. The results were related to other studies and to immigration policy. The results of the investigation were published in *Intelligence and Immigration*. Baltimore: Williams and Wilkins. 1926. 127 pages.

Some of the most interesting conclusions were:

There was demonstrated an influence of linguistic handicaps upon test scores.

There appeared differences, however, in test scores and academic achievement in favor of the Americans and Finns not readily explainable by environmental handicaps.

An inverse relationship was found between size of family and intelligence of the children.

LIVELY, CHARLES E., Associate Professor of Sociology

Movements of open country population, chiefly in Ohio. Attempt to arrive at an accurate understanding of the nature and extent of the movements of families and individuals living in the open country. Implications of such movements with respect to theories of selective migration. Publications:

Increases and decreases in the open country population in Ohio, 1910-20.

Journal of Farm Economics 6:248-53. 1924.

Movement of open country population in two townships of north-western Ohio (with P. G. Beck). *Department of Rural Economics, Rural Sociology Mimeograph Bulletin* No. 3, 1928. 41 pages.

Movement of open country population in three townships of north-eastern Ohio (with P. G. Beck). *Ibid.* No. 4. 1928. 36 pages.

Movement of open country population in three townships of south-eastern Ohio (with P. G. Beck). *Ibid.* No. 5. 1929. 27 pages.

Movement of open country population in Ohio: I. The family aspect (with P. G. Beck). *Ohio Agricultural Experiment Station Bulletin.* (In press.) Approximately 50 pages.

Movement of open country population in Ohio: II. The individual aspect (with P. G. Beck). *Ibid.* (In press.) About 50 pages.

Farm family standards of living. Studies of farm family living by the method of household accounts kept by co-operating families plus supplementary surveys. Special emphasis upon the correlative relationship of various family living factors, such as income, expenditure, education, etc. Publications:

Expenditure for family living on 26 Ohio farms. *Mimeograph Bulletin of the Department of Rural Economics, Ohio State University.* 1926.

Expenditure for family living on Ohio farms. *Ohio Agricultural Experiment Station Bulletin.* (In press.) Approximately 35 pages.

Family living on selected Ohio farms: thesis for Ph.D. degree accepted by University of Minnesota, 1930. 150 pages.

Rural organization. A series of studies calculated to reveal the nature of the rural organization situation and aid promotional agencies in adjusting their efforts to it. Publications:

- Some rural social agencies in Ohio, their nature and extent. *Ohio Agricultural Extension Bulletin*. 1921. 44 pages.
- Factors to be considered in the development of a state program of agricultural improvement—from the sociological standpoint. *Proceedings of the Association of Land Grant Colleges*, 1923; pages 300-308; *Journal of Rural Education* 3:289-98. 1924.
- Some rural social agencies in Ohio, their nature and extent. *Ohio State University Agricultural Extension Service Publication*. 1924. Pages 101-106.
- The county agricultural agent: his job and training. *The Journal of Rural Education* 5:394-99; *Ohio Extension Service News* 12, No. 3. 1927.
- The leisure and culture of farm people in relation to type of agriculture. *Farm Income and Farm Life*, E. D. Sanderson, editor. Chicago. 1927. Pages 205-10.
- Type of agriculture as a conditioning factor in community organization. *Publications of the American Sociological Society* 23:35-50. 1928.
- Sociological research ready for utilization. *Rural Sociological Adult Education in the United States*. Social Science Research Council Monograph. Pages 29-51. 1929.
- The health facilities of farm people and the extent to which they are used. Title self-explanatory. Implications for rural organization. Publications:
- The rural health facilities of Ross County, Ohio (with P. G. Beck). *Ohio Agricultural Experiment Station Bulletin* 412. 1927. 54 pages.
- Rural recreation. Attempt to determine the family, neighborhood, and community facilities available for leisure time activities, and how country people spend their time in relation to those facilities. Implications for rural organization. Publications:
- Rural recreation in two Ohio counties. *Ohio State University Studies. Graduate School Series. Contributions in Rural Economics* No. 1. 1927. 99 pages.
- ZIMMERMAN, CARLE C., Associate Professor of Sociology
Farmers' attitudes and the social psychology of rural life.
- Attitudes of rural preachers regarding church union and science (with C. A. Anderson). *Sociology and Social Research* 12, No. 2:144-50. November, 1927.
- Farmer's marketing attitudes (with J. D. Black). University of Minnesota Agricultural Experiment Station, *Technical Bulletin* 45. 1927. 65 pages.

Rural and urban migration.

Migration to towns and cities. *American Journal of Sociology* 32, No. 3:450-55. November, 1926; 33, No. 1:105-9. July, 1927; (with O. D. Duncan and Fred C. Frey) 33, No 2:237-41. September, 1927.

Studies of rural living.

Objectives and methods in rural living. *Journal of Farm Economics* 9, No. 2:223-37. April, 1927.

How Minnesota farm family incomes are spent (with J. D. Black). University of Minnesota Agricultural Experiment Station *Bulletin* 234. June, 1927. 49 pages.

Family living on Minnesota farms (with J. D. Black). University of Minnesota Agricultural Experiment Station *Bulletin* 240. November, 1927. 24 pages.

Studies of farm expenditures. *Publications of the American Sociological Society* 22:219-21. 1928.

Comprehensive studies of rural life and populations.

Principles of rural-urban sociology (with P. A. Sorokin, Harvard). New York: Henry Holt. 1929. xv, 652 pages.

A systematic source book in rural sociology (with P. A. Sorokin, Harvard, and C. J. Galpin, U.S. Department of Agriculture). Minneapolis: University of Minnesota Press. 1930, 1931. 3 volumes, 1800 pages.

VOLD, GEORGE B., Assistant Professor of Sociology

Predicting outcome on parole in Minnesota. An attempt to apply scientific techniques of a quantitative type to the problem of predicting in advance the probabilities of success or failure of men placed on parole.

WORK COMPLETED TO DATE

PLAN OF RESEARCH

A careful study of the official records of the Minnesota State Board of Parole in an effort to trace out the connection between factors, traits, or conditions relating to the convict's past life and his behavior while on parole. By taking account of the cumulative effect of many factors (25 gave the best results), prediction tables have been devised which indicate significant differences between various classes of men. For men falling in score classes at the upper end of the scale the probabilities of violation are less than 1 in 100; for those falling at the lower extreme of the scale the chances of violation are as high as 86 in 100.

PUBLISHED REPORTS, OR ABOUT TO BE PUBLISHED

Factors entering into the success or failure of Minnesota men on parole. *Publications of the American Sociological Society* 24: No. 2, pages 167-69. May, 1930. (A ten-minute paper read before the section on Social Research of the American Sociological Society, Washington, D.C., December, 1929.)

Some possibilities in the predicting of success or failure on parole. *1930 Minnesota State Conference and Institute of Social Work: Papers and Proceedings of Annual Meeting*. (Forty-minute paper read before the joint meeting of the sections on Delinquency and the Family. Will be published in spring of 1931.)

Factors involved in the violation or non-violation of parole in a group of Minnesota adult males. (Ph.D. thesis. Will be published, probably in full, in an early issue of the *Journal of Criminal Law and Criminology*.)

WORK NOW IN PROGRESS

An attempt is under way to test out the "workability" of parole prediction tables in practice. The tables already worked out are being applied in "predicting" the outcome on parole of a new group of about 600 cases released since the first part of this project was started. This will indicate whether the Parole Board could have foretold (by means of the techniques already developed) the probable chance of parole violation of any given man in this group at the time, or before, he was released on parole.

An attempt is also being made to get the members of the Parole Board to indicate (on a simple quantitative scale) their judgment of the probable chances of success or failure of current cases being placed on parole.

SIGNIFICANCE OF THIS PROJECT

The results thus far obtained point to the reasonable conclusion that if techniques similar to those here developed were to be applied by the Minnesota Parole Board to the problem of diagnosis, it would be possible to determine with considerable accuracy the probable conduct of any candidate for parole. This would seem to indicate the possibility of placing parole practice on a sound scientific and experimental basis instead of the present routine administrative procedure.

*Large National and International Research Projects to Which
Several Members of the Department Contribute*

The Encyclopedia of the Social Sciences. A vast project under the auspices of ten learned societies. The following members of the Department of Sociology contributed articles to Volumes 1 (1930) and 2 (also 1930): Max S. Handman, professor of sociology, Malcolm M. Willey, professor of sociology, Carle C. Zimmerman, associate professor of sociology.

Social Science Abstracts. Published under the auspices of the Social Science Research Council. The problem: to make accessible in abstract form and at regular intervals without serious loss of time, all of the important articles dealing with economic, political and social relations published in the languages of the world.

F. Stuart Chapin, Ph.D., professor of sociology and chairman of the Department of Sociology was the organizer and is the editor-in-chief of *Social Science Abstracts*; Max S. Handman, professor of sociology; Malcolm M. Willey, professor of sociology, and Wilson D. Wallis, professor of sociology and anthropology, are consulting editors.

References to printed sources describing the participation of F. Stuart Chapin and other Minnesota scholars in the early development of the plan and its subsequent realization in the organization and establishment of *Social Science Abstracts* are as follows:

Report of Committee on Social Abstracts. *Papers and Proceedings of the American Sociological Society* 15:242-49. May, 1921.

Social Science Abstracts. *The American Political Science Review* 18, No. 3:611-14. August, 1924.

Social Science Abstracts. *Bulletin des Relations Scientifiques*, Société des Nations, III C Année, No. 3:121-23. August, 1928.

An institution in the making, *Social Science Abstracts* as an example of social invention and social engineering. *American Journal of Sociology* 36, No. 3. November, 1930.

In its first two years (1929-30), *Social Science Abstracts* has made available in summary the significant contents of over 27,000 important contributions to science and learning in 5,000 serials of the social sciences in the 35 leading languages of the world.

Social Science Abstracts represents international intellectual co-operation among scholars because it is a collective product depending upon 1,500 co-operating scholars in 45 nations for its organization and continued functioning. *Social Science Abstracts*, in common with the other great abstracting services, helps to advance science and knowledge by printing the results of research in one specialty in close juxtaposition and in organic relationship with the results of other specialties. Thus there is no offense given to the sensibilities and habits of thought of the specialist and yet the evils of compartmentalism are avoided. For the specialist may now read on the borderline of his subject and pick up new leads. He may delve into the literature of allied subjects and

discover critical cross-lights on his own narrow interest. The synthetic type of mind can draw from the broad record those elements that may integrate into a new and significant unity. Scholars of different nations and with different cultural heritages may pool the results of their individual research in a common medium of international range and scope.

THE DEPARTMENT OF GEOGRAPHY

DAVIS, DARRELL HAUG, Professor of Geography and Head of the Department of Geography

During the period 1923-29, the state of Kentucky completed and published in six volumes a reconnaissance geographic survey of the state. Of these six studies, three were conducted by D. H. Davis.

These surveys were in the nature of inventories and analyses of the resources and activities of the areas studied, with general recommendations as to possibilities for the betterment of conditions.

This is the first geographic survey attempted and put through to completion by any state, and to that extent is noteworthy. Public interest in the findings is indicated by the fact that the supply of the first volume (*Geography of the Jackson Purchase*, D. H. Davis) was exhausted within less than one year from the date of publication, and that despite greatly enlarged editions of subsequent volumes, the supply of all has proven inadequate.

Development of techniques of geographic field work, with articles on the same. Of interest and value to professional geographers engaged in field projects.

HARTSHORNE, RICHARD, Assistant Professor of Geography

An analysis and interpretation of the lake traffic at Chicago, particularly in comparison with rail traffic. This formed a part of the *Chicago River Bridge Survey*, made for the city of Chicago, 1925. The most important findings were:

Explanation of the significance of lake transportation to the Chicago grain market.

The relation between the proportionate use of lake shipping for grain at Chicago and the total annual export movement of grain from the United States.

The fact that the choice of lake, rather than rail transportation for anthracite coal to Chicago, depends on the corporate relations between local distributors and the "anthracite" railroads.

A neglected opportunity for very large savings in shipping costs at a coke plant operated as a public utility.

The first satisfactory exposition of the location of steel industries. This involved an explanation and amplification of the well-known, but faulty, rule, "iron moves to coal," and a refutation of widely accepted theories.

In connection with the problem cited above, and others that followed, there was developed an original method of measuring in quantitative form, the relative importance of the various factors influencing the location of any particular type of manufacturing industry.

BROWN, RALPH H., Assistant Professor of Geography

A field study of past and present land uses of the Connecticut Valley in Massachusetts showing the increasing significance of the natural environment complex in such uses, which substantiates one of the most fundamental principles of geography.

A field study of the sequence of land occupancy in an irrigated lowland, the San Luis Valley of Colorado, and a map presenting the deteriorating effects and consequences of faulty irrigation in the same area.

The only available study of the characteristics and functions of the mountain passes of Colorado, which will appear in the 1931 edition of the state yearbook.

DICKEN, SAMUEL NEWTON, Instructor in Geography

A field study of the evolution of the Karst landscapes in the Mississippian area of Kentucky which develops the sequence of the land forms. This is a distinct contribution to our knowledge of the processes and stages in the evolution of land forms.

SUMMARY OF RESEARCH IN THE COLLEGE OF
ENGINEERING AND ARCHITECTURE AND
THE SCHOOL OF CHEMISTRY

LIND, SAMUEL C., Professor of Chemistry and Director of the School of Chemistry, and GLOCKLER, GEORGE, Associate Professor of Chemistry

Investigation of the formation of a mixture resembling petroleum from lower hydrocarbons.

With the co-operation of the American Petroleum Institute, Dr. S. C. Lind and Dr. George Glockler have been engaged in the investi-

gation of the effect of electrical discharge in condensing gaseous hydrocarbons to liquid and solid products. The gaseous products have been analyzed. The liquid products have been partially fractionated. It has been determined that either light or heavy oils can be produced, covering the entire range from gasoline to heavy lubricating oil. The conditions for controlling these properly have been determined. Final conclusions as to the economical possibilities have not been drawn, although it appears that the process might have application to the production of lubricants, but probably not to the production of liquid fuels, except possibly in a gas field where the gas would otherwise be entirely wasted.

Four publications have been made in the *Journal of the American Chemical Society* and one in the *Transactions of the American Electrochemical Society*.

MANN, CHARLES A., Professor of Chemical Engineering and
Chief of the Division of Chemical Engineering
Zeolite water softening mineral.

As a result of four years work, a very efficient zeolite water softening mineral has been developed in the Chemical Engineering laboratories for the removal from water of those constituents which make water hard. This mineral can be used over and over without loss of effectiveness. It may be used for domestic softeners or for industrial softeners. Removal of hardness of water means a tremendous saving of soap in the household and in laundries and less scale in boilers. In some food industries, water free from lime must be used. The zeolite mineral removes this lime. In some parts of Minnesota, the water contains large quantities of magnesia which cause bone disease in cattle. Under certain conditions, this magnesia can be removed with the water softener. Experimental work is still being carried on to determine better methods of making this mineral and also to learn just how the mineral removes the hard constituents in water.

Corrosion inhibitors.

Yearly many thousands of dollars are lost due to corrosion of iron and steel and many more thousands are lost in the preparation of iron and steel for other than construction purposes by dissolving not only rust but the underlying iron by means of acids. Certain organic materials containing nitrogen added to the acid allow only the rust to be removed and protect the iron itself from the action of the acid. Added to paints these inhibitors prevent painted steel from rusting under the paint. A considerable number of these inhibitors have been discovered and tested. The work is still in progress and it is hoped better and cheaper inhibitors may be found.

Utilization of agricultural wastes.

Generally corncobs and straws are burned to dispose of these wastes. Many valuable products may, however, be obtained from them. By

destructive distillation methods the Chemical Engineering Division has been able to obtain gas of high heating value, carbon products which may become important in the paint and the rubber tire industries, tars and a host of other chemical products. Because of the large amount of work done on the utilization of these wastes, the Division of Chemical Engineering has been asked to co-operate in the development of a United States experiment station to investigate the utilization of farm wastes. More information is in the hands of the staff of the Chemical Engineering Division on this subject than is available from any similar organization.

SNEED, M. CANNON, Professor of Chemistry and Chief of the Division of Chemistry
Corrosion of lead by cements and concrete.

Dr. M. C. Sneed has found remedies which will prevent the rapid corrosion of lead in these materials, the application of which will be of great benefit in such structures as cement grain elevators, and in any other similar structures where lead is exposed to this type of corrosion.

PARCEL, JOHN I., Professor of Structural Engineering; MANEY, GEORGE A., Associate Professor of Civil Engineering; MILLER, DALTON G., Senior Drainage Engineer, United States Department of Agriculture, and WISE, JOSEPH A., Assistant Professor of Structural Engineering

Investigations of secondary stresses and statically indeterminate stresses in steel and concrete structures.

This group includes the following:

- (a) Secondary stresses and other problems and rigid frames, by G. A. Maney.
- (b) Secondary stresses in the Kenova bridge, by J. I. Parcel and G. A. Maney.
- (c) The design of flat plates by the method of the elastic web, by J. A. Wise.
- (d) Design of reinforced concrete flat slabs, by J. A. Wise.
- (e) Statically indeterminate stresses, by J. I. Parcel and G. A. Maney.
- (f) Mathematical and experimental analysis of drain tile testing, etc., by D. G. Miller and J. A. Wise.
- (g) A number of discussions on theory of structures appearing in engineering periodicals.

Regarding the importance of these investigations, the methods expounded in (a), (b), (c) and (g) have been widely adopted and used in engineering offices for the analysis and design of arches, rigid frames and large trusses. The text (e) has been widely adopted in many technical colleges as a standard text in advanced structures. The

theory and procedure for design advocated in (c) and (d) have been incorporated in the "Standards of Design for Concrete, U. S. Navy" which standards were prepared in part with the assistance of Professor Wise. The information obtained in (f) has been applied in the field and laboratory testing of drain tile and pipe, particularly by the U. S. Department of Agriculture.

PRIESTER, GEORGE C., Professor of Materials of Engineering

Effect of temperature on the mechanical and microscopic properties of steel.

Two papers: first, published in *Chemical and Metallurgical Engineering*. January 17, 1923; second, published in *Translations of the American Society for Steel Treating*, Volume 11.

The first paper describes the results obtained on tests of a quenched 0.16 per cent carbon steel at temperatures up to 1112° F. and on the same steel as hardened and then tempered at temperatures up to 1112° F. and then tested at room temperatures.

The second paper describes similar results obtained from an 0.29 per cent carbon steel.

From these results, it is possible to determine the safe-working load of these steels when the steel is used in machines and structures which must work at elevated temperatures.

Mechanical and machining properties of an annealed cast iron.

This paper sets forth the results of a study of the machining and mechanical properties of a cast iron used in the manufacture of pistons for automobiles. The machining properties of the annealed pistons were studied in a modern production plant. The results of heat treatment, the chemical analysis, machining properties, transverse tests, tensile and hardness tests, compressive and shear tests, and the effect of time on annealing are tabulated and correlated. The microstructure of the test bars are shown in photomicrographs. From the results, it is possible to determine the proper heat treatment for cast iron pistons which would have satisfactory machining properties and, at the same time, possess adequate strength and abrasion properties.

ROWLEY, FRANK B., Professor of Mechanical Engineering

Heat transmission through building materials.

An important factor for the home builder in Minnesota is the amount of heat required to keep his house comfortable during the winter months. The size of the heating plant and the amount of fuel required will be directly proportional to the heat loss from the building. A research program carried on in the Engineering Experiment Station at Minnesota has resulted in accurate methods for determining transmission through insulating materials and built up wall sections. Heat transmission coefficients have been determined for many different types of building construction, both with and without insulating ma-

terials. These researches have shown reductions of as much as 50 per cent in the heat flow through an insulated wall as compared with the same wall without insulation.

The economic value of insulation depends upon several factors, the most important being the cost of the insulation applied to the wall and the amount of heat saved. No specific amount of insulation can be prescribed for all cases, but, considering the fact that over thirty million dollars per year are spent for heating in Minnesota, the builder can afford to give some consideration to a heat resisting construction.

Quality of workmanship has proved to be an important item in the results obtained. For instance, two walls constructed from the same materials, one with good workmanship and the other with poor workmanship, have shown an improvement of 50 per cent in the insulating value of the properly constructed wall.

The results of these researches have been published from time to time in the form of papers and as an Experiment Station bulletin. A new Experiment Station bulletin is being prepared which it is expected will be ready during the spring.

Dust in air.

One of the important factors in good ventilation is to obtain air free from dust. All air contains dust in various proportions, and freedom from dust must be rated in relative units. Since dust occurs in such wide ranges of size, weight, and shape of particles, a unit of measure which is satisfactory and acceptable to engineers has never been obtained.

In order to compare the characteristics of the various methods and to select or develop one which would be practical for engineers and sufficiently accurate to meet the requirements of science, researches have been in progress in the Engineering Experiment Station for the past three years. This study has included several methods and has resulted in improvements on the dust count method which make it more accurate and reliable. The work will be extended to cover other methods, with the hope of selecting one which will fulfill all of the practical requirements.

LANG, FRED C., Associate Professor of Highway Engineering Bituminous treatment of clay subgrades.

Investigation was carried on in the laboratory and in the field. Since this investigation was completed, about 200 miles of this type were constructed in Minnesota. Bituminous treatment has given a better road at much less cost, particularly in those areas such as the Red River Valley where the country is very flat and gravel is scarce and expensive.

Effect of shale in concrete.

The gravel deposits over a large area in Minnesota contain various percentages of shale. The amount which is permitted in highway

specifications for concrete pavements determines to a large extent the cost of the pavement in certain areas. The Highway Department specifications to a large extent set the standard of quality for aggregates in this State. No commercial plant can be successful unless its product meets the State Highway Department specifications.

Soundness tests on Minnesota stones.

The durability of concrete to a large extent depends on durability of the stone used as coarse aggregate. This investigation showed the relative durability of the various stones in the state.

Effect of character and shape of aggregates on flexural strength.

Concrete pavements are designed on flexural strength of concrete, whereas the compressive strength is used as a basis of design for most concrete structures. As a result of this investigation one stone in Minnesota was considered unsuitable for use in concrete pavements.

Accuracy of water measuring devices on concrete mixers.

Up to the time of this investigation very little had been published on the subject of the accuracy of water-measuring devices, although it was recognized that the quality of the concrete depended to a great degree on the amount of water used per sack of cement. As a result of this investigation, many defects in the water measuring devices were pointed out and improvements made. Manufacturers sent their representative here at the time the investigation was going on, and made improvements almost immediately. As a result of this investigation, the accuracy of the measuring device on concrete mixers on highways has been greatly improved.

BOEHNLEIN, CHARLES, Assistant Professor of Mathematics and Mechanics.

The reaction of a nozzle on a flat plate.

The dynamic reaction of a jet of water impinging on a flat plate has been studied for a good many years. Nobody had, however, investigated just how close this flat plate could be brought to the nozzle tip without diminishing the dynamic reaction and the law which connected the diminishing of the dynamic reaction with the distance between the plate and the nozzle tip was not clearly understood.

The combination of a flat plate and a nozzle is used in many forms of governors and the regulating mechanism causes the distance between the plate and nozzle to vary. These governors are used in particular on pulp grinding machines in paper mills. Some forms of these governors had been giving difficulty because the variation of the dynamic reaction was not completely understood.

DOW, CHARLES H., Assistant Professor of Civil Engineering, and
KIRK, RAYMOND E., Associate Professor of Chemistry
The use of marl in road construction and in the manufacture
of Portland cement.

The Engineering Experiment Station has published three bulletins on marl: Bulletin No. 1 on the Use of Marl in Road Construction, and Bulletins No. 2 and 4 on the Manufacture of Portland Cement from Marl.

Since the publication of Bulletin No. 1, marl has been used quite extensively as a binder for sand in surfaces on local roads in sandy areas where marl is available near the road. The road is very dusty in dry weather and on this account is not satisfactory where roads carry a considerable volume of traffic unless given a bituminous surface treatment. The marl deposits are usually in swampy areas covered with humus material. This makes the excavation expensive and for this reason it is not used as much as it otherwise would be.

Marl is the only calcareous material found in any quantity in Minnesota that is suitable for the manufacture of Portland cement. On account of the available suitable deposits being a considerable distance from the consuming centers and the expense of excavating and handling this saturated material, no cement mills have yet been built in this state to use it.

HARTIG, HENRY E., Assistant Professor of Telegraph and Telephone Engineering, and WILCOX, HUGH B., Associate Professor of Mathematics and Mechanics

An absolute method for measuring the velocity of fluids.

The idea was conceived by the writers that the velocity of fluids could be measured by impressing a sound wave upon the fluid and measuring the difference in the rate of propagation of the sound in the direction of fluid motion and in the opposite direction. Experimental work shows that a high degree of accuracy can be attained by the method. At present gas velocities, especially low gas velocities, are very hard to measure continuously without expensive, bulky and inconvenient apparatus. The apparatus under development will provide a means especially adapted to the range of velocities which are the hardest to measure by other means. A further advantage is that the apparatus does not require calibration.

JOHNSON, ELMER W., Assistant Professor of Electrical Power Engineering

The Minnesota state motor vehicle light laws and design and construction of equipment for making acceptance tests of automobile lights sold in Minnesota.

All the types of headlamps, rear lamps, signal lamps, auxiliary driving lamps, and spot lamps submitted to the Department of Highways for approval have been tested in the motor vehicle light testing laboratory.

One thesis for the Master's degree has been taken in connection with this work. A number of investigations for the Department of Highways have been carried out in regard to the most desirable reflector warning signs, the results of which they have used in determining the type to be adopted for use on the roads of this state. The supervisor of the laboratory has served in an advisory capacity to the Department of Highways on questions relating to highway lighting.

MCMILLAN, FRANKLIN R., Assistant Professor of Experimental Engineering and LAGAARD, MAURICE B., Assistant Professor of Civil Engineering

Researches in the properties of concrete under various conditions, including shrinkage, time effect, waterproofing compounds, etc.

This group includes the following:

(a) Shrinkage and time effects in concrete, by F. R. McMillan.

(b) A large number of brief papers and discussions in technical periodicals, by McMillan and Lagaard.

The publication (a) is recognized as the pioneer investigation of one of the most important phases of concrete construction. The results noted here and from the later work of McMillan and Lagaard in the structural laboratory, University of Minnesota, have greatly influenced the design and construction of all types of concrete structures and have paved the way for the more detailed investigations which have of late constituted the main program of research of the great Portland Cement Association laboratory in Chicago.

LAVINE, IRVIN, Instructor in Chemical Engineering
Studies in the development of North Dakota lignite.

The tremendous tonnage of lignite in our neighboring state, North Dakota, has long attracted the attention of industrial chemists and engineers as a great potential source of power and fuel. The ash content of the lignite being low, the only great obstacle to its utilization lies in its high moisture content. If it can be economically dried without interfering with desirable properties, and if it can be put into a suitable condition after drying to be utilized as a domestic and power fuel, the whole Northwest will thereby derive a great benefit. Experiments have been carried out by Mr. Irvin Lavine under the direction of Dr. C. A. Mann, and in co-operation with the Department of Mines of the University of North Dakota under the direction of Dr. A. W. Gauger. Three points of attack have been made. One, drying by means

of high pressure steam so as to avoid subsequent pulverization. Two, low temperature carbonization of dried lignite for purposes of coking. Three, the determination of the critical oxidation temperature which is a measure of its resistance to spontaneous combustion.

Satisfactory results on the first point have been obtained. Investigations are in progress on the latter two. Four publications have been made in *Industrial and Engineering Chemistry*, November, 1930.

Some Current Investigations

MANN, CHARLES A., Professor of Chemistry and Chief of the Division of Chemical Engineering
Electrolysis of metal perchlorates in non-aqueous solvents.

On account of the impossibility of depositing some metals from water solutions of their salts, Dr. C. A. Mann is investigating the deposition of metals from their perchlorates, many of which are soluble in certain non-aqueous solvents. Much progress has been made, particularly in the case of silver, lead, cadmium, nickel, and cobalt.

Study of the fundamental principles of drying materials.

The drying of certain vegetable materials including wood is being investigated under the direction of Dr. C. A. Mann. A quick and efficient process is required which will not produce warping or damage the material in any other way. The solution of this problem will have immediate application in the lumber and agricultural industries of Minnesota.

REYERSON, LLOYD H., Professor of Chemistry
The catalytic chlorination of hydrocarbons.

This will lead directly to the higher utilization of some of the hydrocarbons contained in petroleum mixtures.

MONTONNA, RALPH E., Associate Professor of Chemistry
Utilization of waste sulfite liquor.

The utilization of waste sulfite liquor is the subject of current investigation under the direction of Dr. R. E. Montonna in the School of Chemistry. An attempt is being made to prepare vanalin from the ligno-sulfonic acid which has in previous research been isolated from the waste liquors of the sulfite paper mills. The problem is an important one in this state and all the more important since a federal act has prohibited the pollution of interstate streams with waste liquor from paper mills.

SUMMARY OF RESEARCH IN THE SCHOOL OF MINES AND
METALLURGY

THEORY OF HARDENING OF STEEL

The decomposition of the austenitic structure in steel, a proposed theory for the hardening and tempering of steels, was given special attention by former Professor Oscar E. Harder of the Department of Metallography and Professor Ralph L. Dowdell of the Department of Metallography, School of Mines and Metallurgy, University of Minnesota.

This theory discusses, in addition to the decomposition of the austenite structure, the reactions on heating steels above the critical points, the changes which take place while holding at temperature, changes which take place at various rates of cooling and, finally, the changes which take place on reheating hardened steels to various temperatures below the critical for different lengths of time.

The results of this investigation were published in the *Transactions of the American Society for Steel Treating* and the authors were awarded the Henry Marion Howe medal by the American Society for Steel Treating. The above mentioned award was the first instance of the award having been given to men engaged in educational work.

TREATMENT OF MAGNETIC IRON ORES

In order to investigate the possibility of magnetically concentrating the Minnesota low-grade iron ores, it was necessary for the Mines Experiment Station to provide itself with various magnetic concentrators and certain auxiliary machines. As the station is called upon to make tests upon a great variety of ore samples, varying in size from a few ounces to several tons, it was necessary to provide machines of different capacities as well as of different types.

The magnetic tube concentrator was constructed for the purpose of concentrating small, finely crushed samples of ore containing ferromagnetic minerals. This machine is a very satisfactory laboratory unit and is almost indispensable where work is being done on finely ground magnetic ores. From the results secured by use of this machine it is possible to determine not only the amount of magnetic material in the sample of ore, but also

the grade of concentrate that can be made when the ore is crushed to various sizes.

As the result of a further large amount of experimental work at the Mines Experiment Station the magnetic log-washer was constructed. As the name implies, this machine is similar to the log-washers now in common use in the Lake Superior district. Magnets have been applied to the lower side of the machine in such a manner as to place the whole bottom of the trough in a magnetic field. This machine is adapted to the concentration of finely ground ores, preferably 48-mesh or finer. A great many tests have been made upon this machine and the results have been most satisfactory where the machines have been installed.

SUMMARY OF RESEARCH IN THE MEDICAL SCHOOL

THE DEPARTMENT OF ANATOMY

C. M. Jackson has worked along two chief lines. (1) An experimental study of the effects of inanition (starvation) of various types on the growth and structure of the body. He published a book on this subject in 1925, and a large number of papers at various times in scientific journals. The results are important in their bearings on both human and animal nutrition. (2) A study of the physical measurements (height, weight, vital capacity, etc.) of the University of Minnesota students, both men and women. It is shown that the students have comparatively a very good physique and that it has distinctly improved during the past thirty years. Some of the results are included in a recent book on *The Measurement of Man*, published by the University of Minnesota Press.

R. E. Scammon has made extensive application of biometric and statistical methods in the study of human growth, both before and after birth, through childhood up to the adult state. He has demonstrated that the various organs and parts of the body can be classified under four main types of growth—the general, neural, lymphoid, and genital. The results of these studies have been published in a large series of papers and monographs. These include two books, published by the University of Minnesota Press: (1) (with L. A. Calkins) *The Development*

and Growth of the External Dimensions of the Human Body in the Fetal Period; (2) *The Measurement of Man.* Dr. Scammon is recognized as one of the leading authorities in his field of work, which has important bearings upon child welfare, education, and medicine.

A. T. Rasmussen has published about thirty papers and chapters of books dealing especially with problems concerning the hypophysis (pituitary gland) and the nervous system. He found that the hibernation of the woodchuck is probably due to the inactivity of the hypophysis. An extensive series of microscopic measurements on the human hypophysis (male and female) has made it possible for the first time to establish norms of structure for this important organ. Through animal experiments, various neurological problems have also been studied, the results of which settle some disputed points as to the relations and significance of several nerve tracts.

Hal Downey's research of the last ten years has been primarily along the following lines: (1) Development of the blood-forming organs and the origin of the first blood cells of the embryo. (2) Origin and relationships of blood cells in the adult. (3) Study of blood diseases, especially anemia and leukemia, in an attempt to determine their origin, and to provide satisfactory means of classification and diagnosis. A great variety of normal and pathologic human material has been used in these investigations, and animal material has been studied for comparison. Numerous papers dealing with various phases of the above topics have been published in technical journals and the results are now being gathered together in a book which will be published in the near future.

DEPARTMENT OF BACTERIOLOGY

W. P. Larson's work during the past ten years research work has been chiefly concerned with the effect of surface tension of the culture medium on bacterial behavior and the effect of surface tension on bacterial toxins. The results of these researches have been published in a series of twenty-one papers. The behavior of many bacteria which had not been explained up to the time that this work began has been explained on the basis of the surface tension of the menstruum. A study of all possible surface tension depressants was made. It was found that the salts of

the unsaturated fatty acids were the most suitable surface tension depressants for use in the general field of bacteriology. It was also found that these salts would neutralize many of the bacterial toxins in such a way as to make them suitable for immunizing purposes. The toxin of the scarlet fever streptococcus was neutralized in such a way as to make the vaccination against scarlet fever practical. During the past four years the scarlet fever vaccine which was developed in this laboratory has been the favored product among physicians throughout the United States.

A combined vaccine against both diphtheria and scarlet fever has been prepared which could be given at the same time, thus cutting down the number of injections necessary for immunization from eight to three. These investigations have further thrown light on the hitherto unexplained observation that some poisonous products, such as poisonous mushrooms and the botulinus toxin, are toxic when taken by mouth, which is not true of ordinary bacterial poisons. At the present time the importance of the fatty acid compounds of the body from the standpoint of immunity and resistance to disease is being investigated.

During this period the question of pneumonia serums has been investigated and four papers published thereon. One paper each on the following subjects has been published during this period: The relation between fixed and free salts of bacteria; The conductivity of bacterial cells. Two papers were published on the relation of the *Bacillus abortus* to human diseases. In these papers it was shown that the *B. abortus*, which causes a common disease among cattle, might under certain conditions affect man. This work has since been confirmed by other investigators both in this country and abroad.

Arthur T. Henrici during the past ten years has carried on research work in two fields. The first has dealt with problems of morphologic variation and life cycles in bacteria. Twelve papers covering this field of work have been published and finally these investigations have been summarized in a research monograph *Morphologic Variation and the Rate of Growth of Bacteria* which was published in '1928 by Charles C. Thomas. The second field of work has had to deal with the molds, yeasts, and actinomycetes, particularly from the medical standpoint. Five papers have been published dealing with the acidfast actinomy-

cetes, immunological studies of actinomycetes, the pleomorphism of the parasite of thrush, and a systematic study of yeasts in soil. A paper on the toxins of *Aspergillus fumigatus* is ready for publication. A textbook on *Molds, Yeasts, and Actinomycetes* (John Wiley & Sons, 1930) has just been published.

Robert G. Green during 1920 and 1921 directed investigations toward electrical conductivity of bacterial cells. In co-operative work with Dr. W. P. Larson, many errors were found in the prevailing concept of such a system. Further co-operative studies were carried out, with Dr. F. H. MacDougall, on the theory of electrical conductance of suspensions. In the latter studies bacterial, yeast, and blood-cell systems were used. Four papers were published.

A new direct reading apparatus for measuring surface tension was devised and its description published. In co-operation with Dr. H. O. Halvorson, a new theory of surface energy as a controlling factor in agglutination and dispersion was published in 1924. Five papers on surface energy were published.

Investigation of pancreatic extracts was carried out in 1923 and 1924. The first insulin in the Northwestern States was produced during the course of this work. Two publications were made.

New concepts from the study of surface energy and conductivity instigated a specific investigation of red blood cells in 1923 and 1924. Four publications were made concerning the mechanism of hemolysis and the clinical fragility test in pernicious anemia.

Beginning in 1925 research was directed by request of the American National Fox Breeders Association toward diseases occurring in carnivorous animals, such as foxes and mink. A new disease of foxes, a paratyphoid infection, was described in two publications in 1925. Epizootic encephalitis of foxes was discovered in 1926. As work on this disease progressed, the Bureau of Biological Survey offered co-operation in its study. This co-operation was established in October, 1927, and is still in effect. An effective vaccine and an effective anti-serum have been produced. Six further publications on encephalitis have been made in co-operation with the Bureau of Biological Survey, and a series of six more papers is now in the course of preparation.

A study of mushroom poison was made in 1927 in co-operation with Dr. A. V. Stoesser. There were two publications.

Following the disappearance of rabbits and grouse in Minnesota in 1925 and the simultaneous occurrence of tularemia in humans, investigation has been carried out upon this disease. In co-operation with Dr. E. C. Hanson of Park Rapids, seven cases of human tularemia in Minnesota were studied and reported. This doubled the number of cases known at that time. For the first time it was shown by clinical and experimental studies that the cat is a vector of tularemia. The first reported demonstration was made of tularemia in muskrats and birds. Ruffed grouse were found to be very susceptible. Definite infections were produced in other birds such as the pigeon and the ring-necked pheasant. Final proof of tularemia as a disease of birds was accomplished in 1929 by the demonstration of a natural infection in a quail found near Minneapolis. Studies have been made on the longevity of *bacterium tularense* in dead animals. Ten publications have been made on tularemia.

C. E. Skinner's interests have been centered on the physiology of bacteria in relation to soil fertility, and bacteria in relation to the sanitary analysis of water.

The decomposition of cellulose first engaged his attention and the effect of accessory factors on the decomposition of cellulose was studied. It was found that the seeming stimulation by bacteria elaborating vitamin B could be explained by the facts known as to the physiology of the micro-organisms concerned. The cellulose decomposing ability of certain bacteria was established by quantitative methods, which work has been confirmed by others.

The fact that strains of the well-known *B. aerogenes* fixed elementary nitrogen was established and a method for the easy isolation and identification of the important species of Azotobacter was devised. Together with Miss Clara Gardner, it was established that certain green algae in darkness as well as in light were able to utilize not only sugars but organic nitrogenous compounds and organic salts as a source of energy in addition to, or independent of, the energy derived from sunlight. In co-operation with Mr. Millard Gunderson of this department and Dr. Cornelia Kennedy of the Division of Agricultural Biochemistry, the effect of light on the elaboration of vitamins A, B, C, D, and

G, has been studied using algae grown in darkness in pure cultures on synthetic media, in an attempt, which has been partly successful, to establish whether or not light is essential for the formation of each vitamin.

In co-operation with Mr. Iver Nygard of the Division of Soils, it was found that the distribution of *Azotobacter chroococcum* and *A. vinlandii* in peat soils is limited by pH. Together with Mr. J. W. Brown, it was found that the Eijkman test for the sanitary quality of water failed to detect a large proportion of the fecal bacteria.

H. O. Halvorson is interested and doing active research in two major fields—first, the application of mathematics and physical chemistry to the field of biology, with particular reference to bacteriology; and second, the application of bacteriology to industry, and fundamental research in industrial bacteriology.

During the past year, Geo. A. Hormel & Co., of Austin, Minnesota have been giving financial support for studies on anti-septics. For the coming year financial assistance is being given by the Graduate School in pursuance of investigations on the application of statistics to immunology, and Geo. A. Hormel & Co. are continuing their support. The packing industries at South St. Paul are planning to provide funds for the pursuance of research on the super-chlorination of the Twin City packing house sewage.

Alone or in conjunction with others Dr. Halvorson has published ten papers in the last five years and has several others nearly ready.

THE DEPARTMENT OF PATHOLOGY

E. T. Bell has spent most of his time on the study of diseases of the kidneys. He has made a detailed study of the clinical features and the microscopic anatomy of various kinds of renal disease, particularly glomerulonephritis, nephroses, and essential hypertension, and has published a number of papers on these subjects. His particular achievement is in the finer histology of the glomerulus in these diseases. The work of Dr. Bell and his students on this point has attracted widespread interest among pathologists.

Dr. Bell has also studied valvular heart disease in connection with Dr. Clawson, and has prepared a textbook of pathology

which has recently been published by Lea & Febiger. This includes a large part of the work which the various members of the staff have been doing on special fields.

B. J. Clawson has spent his time on the study of heart disease. He has made particular studies on rheumatic fever and rheumatic heart disease. These have attracted widespread favorable comment. His chief contribution has been the structural changes in the valves in heart disease and the cause of rheumatic fever. He has been able to show rather satisfactorily that rheumatic fever is caused by streptococci. He has just now completed some extremely interesting work on hypersensitiveness to streptococci, showing the importance of this in repeated recurrence of rheumatic fever in the heart. He has laid the foundation for a rational therapy of rheumatic fever, particularly as regards the prevention of recurrences. This therapy has, however, not been tried out in human beings.

J. S. McCartney has been interested in the study of cirrhoses of the liver. He has just about completed a rather extensive study of all the cases of cirrhosis which have come under our observation during the past twenty years. This work throws considerable light on the nature of cirrhosis of the liver. Dr. McCartney has also done some very good work on pulmonary embolism, particularly on post-traumatic pulmonary embolism.

THE DEPARTMENT OF PHARMACOLOGY

A. D. Hirschfelder, E. D. Brown, R. N. Bieter, Harold N. G. Wright have made an extensive study of the pharmacology of aromatic alcohols, and their derivatives; as a result of which saligenin was developed as a local anesthetic and used in cystoscopy for males and females; a pharmacological study of saligenin esters and ethers; a chemical study of derivatives of saligenin and a mercury saligenin compound which was used in the treatment of clinical gonorrhoea.

Studies of the mode of action, penetration, and effectiveness of various antiseptics; and especially of their physicochemical and ultramicroscopic reactions with proteins, blood plasma, and on intravenous injections; studies of these phenomena by means of the ultramicroscope; mechanism of the production of inflammatory edema and inflammation; studies of function of glomeruli and tubules of the kidney and of the physicochemical action of

mercury diuretics; experimental study of effects of excitement on soporific drugs; physicochemical study of the mechanism of anesthesia of the calcium-magnesium antagonism; study of oil of worm-seed (*chenopodium*) and of its antagonization by calcium salts; development of a new method for determination of magnesium in the blood; studies on the poisonous principle of poison ivy and its treatment.

THE DEPARTMENT OF PHYSIOLOGY

Section of Physiology Proper

E. P. Lyon has published brief accounts of experiments on marine forms.

Frederick A. Scott's researches have been chiefly concerned with water relations in the body mainly between the blood and tissues and the effects of altering the water relations on the efficiency of the organ or organs. At present, the effects of the contractility of the spleen is being studied in such conditions as hemorrhage, exercise and asphyxia. A number of papers have been published on the above subjects. Some papers have also been published under Dr. Scott's supervision on the chemistry of the blood, the coagulation of the blood and changes in the blood in a number of diseases.

Joseph T. King has developed facilities for doing tissue culture. A description of the method, more simple than others, has been published. This work is being continued.

Esther M. Greisheimer for a time made a study of the effects of breathing dry and moist air. The interest in respiration continued along the line of irregularities of respiration, encountered in the Minneapolis General Hospital wards. Interest in irritability of the nervous system led to a study of the effects of aluminium chloride and acidified Ringer's solutions on nerve, to a study of blood sugar in relation to irritability, and, while abroad, to a study of the reflex time, velocity of the nerve impulse, and duration of contraction in the tortoise. A study was made of the changes produced by exposure to the Alpine lamp, in the calcium content in tuberculous patients, and of changes in calcium with age. The blood sedimentation test has been studied and work is continuing along this line. Glycogen formation on different

diets has been studied in rats. This work is continuing, with the hope of eventually clearing up some of the questions regarding the diabetic patient, which are unexplained at present.

Section of Physiological Chemistry

J. F. McClendon, colleagues, and students did extensive work on the hydrogen ions of fluids in which cells live and the effects of changes in hydrogen ions on the physiological state of the cells, and the effect of alkali reserve and CO_2 tension on hydrogen ions. More exact and rapid methods of determining hydrogen ions in blood, urine, gastric and duodenal contents, cerebrospinal fluid, and sea water were developed.

The distributions of vitamins A, B, C, and D in foodstuffs were studied, together with the preservation of vitamin C in foods and the pathology of the teeth and bones in deficiencies of vitamin C (and D). Vitamin C was greatly purified in special apparatus and shown to maintain its potency six years. The relation of vitamin D deficiency to phosphorus deficiency and calcium deficiency was studied separately, and the pathology shown to be distinct.

A survey of iodine in drinking water in the United States and part of Canada was made and the goiter records of the Draft Board and the United States Public Health Service compiled. It was shown that regions high in simple goiter were high in exophthalmic goiter also and were low in iodine. A survey of iodine in foodstuffs of Minnesota, North Dakota, and part of Wisconsin is being made, as well as some parts of other states for comparison. Improved methods of iodine analysis in foodstuffs were developed and they are accepted by the Goitre Commission of Holland as the best methods now available.

Six years were spent in building the most perfect Wheatstone bridge for high frequency electric currents and with its aid the polarization capacity of living tissues as well as the intact human body were made and an analysis made of the psychogalvanic reflex. An intimate study of diathermy was also made. It was shown that the basal metabolic rate in women varied with the menstrual cycle and with the level of ovarian hormone in the blood. Injections of ovarian hormone up to 30,000 units were made and it was shown to raise the basal metabolic rate. New

apparatus for measuring the basal metabolic rate and respiratory quotient was perfected. Work is being done on the metabolism of carbohydrates and improved methods of sugar analysis have been developed. Improved methods of fluorine analysis are being made and a study of albuminuria is in progress.

Section of Biophysics

Karl W. Stenstrom's research activities in this division, which started in July, 1926, have been directed mainly to the study of the action of radiation on chemical compounds, animals and patients. Radon, Roentgen, cathode, and ultra-violet rays have been used. Investigation of the diathermy machine and the effect of heat on patients has also been started. Co-operation in attacking a variety of problems has been extended to several other departments.

SUMMARY OF DISCOVERIES, ACHIEVEMENTS, AND
RESEARCH IN THE COLLEGE OF PHARMACY

WULLING, FREDERICK J., Dean of the College of Pharmacy

Survey of some colleges of pharmacy (including the College of Pharmacy, University of Minnesota) covering the old three-year course, especially with regard to teaching force, student enrolment, courses and their credit values and contents, budgets, incomes and expenditures, etc., all as a basis for the new minimum course to become effective in all colleges holding membership in the American Association of Colleges of Pharmacy, not later than 1932.

U. S. Pharmacopoeial revision research. An inquiry into the administrative procedures of about a score of colleges of pharmacy with a view toward some degree of standardization helpful in the transfer of students.

It would be difficult to determine the dollar value of these researches to Minnesota. Their values project themselves into all divisions of medical and pharmaceutical practice and reflect themselves in correspondingly better pharmaceutical and medical serv-

ice. Some of the work, however, has an economic aspect which might be developed in the future.

BACHMAN, GUSTAV, Professor of Pharmacy

Annual investigation into the identity and quality of about 400 pharmaceuticals, medicinal chemicals, and medicinal preparations found in the open market (aggregating about 4,000 examinations during the past ten years).

The results of these researches were communicated annually to the Minnesota State Pharmaceutical Association and were published in the annual proceedings. This research is regarded by the pharmacists as among the foremost contributions toward the maintenance of high standards of quality of drugs and medicinal preparations.

Considerable original work in the improvement of the standards and qualities of preparations included in the National Formulary. (Mr. Bachman is a member of the National Formulary Revision Committee, a position of some honor and distinction.)

Research for the discovery of facts relating to the economical management of drug stores, the work having had the effect of the establishment of fifteen pharmaceutical district organizations to get broader effect and application of the facts discovered.

NEWCOMB, EDWIN L., Professor of Pharmaceutical Botany and Pharmacognosy

Exhaustive work on the improvement of medicinal plant cultivation. A study of the sources of medicinal plants and plant parts throughout the world, and research into the sources of chemicals and inorganic pharmaceuticals in North America.

Research in the field of distribution. A critical study of the United States Pharmacopoeial and National Formulary revision problems.

ROGERS, CHARLES H., Professor of Pharmaceutical Chemistry

Developing a method for determining strychnine in the presence of arsenic trioxide, ferrous carbonate, aloin, and capsicum. Developing a method for the quantitative estimation of sulphur combined as sulphides in potassa sulphurata.

Developing a method for manufacturing ethyl oenanthylate. A study of the expansion and contraction of alcohol water mixtures at various temperatures.

FISCHER, EARL B., Associate Professor of Pharmaceutical Botany

The quantitative determination of the inorganic constituents (total ash, acid soluble and acid insoluble ash) of vegetable and animal drugs, involving 3 separate determinations on nearly 5,000 samples. Work included between 30,000 and 35,000 determinations in all and covered a period of about three and one-half years.

Co-operative research in connection with United States Pharmacopoeia X and National Formulary V Revision Committees in preparation of standards for some 200 or more vegetable and animal drugs. This work has a nation-wide bearing.

Qualitative determinations of the inorganic constituents of vegetable drug ashes. Nearly 400 drugs were qualitatively analyzed for carbonates, sulphates, phosphates, chlorides, boron, sulphur, copper, lead, barium, iodides, bromides, aluminum, iron, manganese, calcium, magnesium, strontium, sodium, potassium, etc.

ALMIN, RUGNAR, Instructor in Pharmacy

An important improvement in the formula for syrup of hypophosphites U.S.P. IX, N.F. V.

An important improvement in the formula for compound syrup of hypophosphites, N.F. V.

Antiseptic solution, N.F. V.

The results of this research have been found useful and in the case of the first one, have been embodied in the U.S.P. X and in the cases of the second and third, will be employed by the revisers of the National Formulary.

JACK, LAURINE D., Instructor in Pharmacy

Work toward improving the official formula for the preparation of soft soap.

SMYTHE, CHARLES E., Instructor in Pharmacy

Researches into the possibility of a single developer for the development of all grades of photographic paper and all makes. Researches into the possibility and practicability of a single developer for both photographic plates and paper.

Researches toward improvement of plant photography in the laboratory, in the field, by daylight and by artificial light, and the better use of backgrounds, natural and artificial.

TURNER, DEL D., Instructor in Pharmacy

A study of the comparative solubility of numerous samples of acetylsalicylic acid tablets under conditions approximating as far as possible those existing in the stomach.

SUMMARY OF RESEARCH IN THE COLLEGE OF DENTISTRY

During the past ten years distinct progress has been made in the study of the two outstanding dental diseases—dental caries and pyorrhea. This has been possible through the developments in the sciences of pathology and bacteriology. The treatment of dental diseases based on these sciences have contributed much to the relief of human suffering and to the length of life in a way which was not possible ten years ago.

At Minnesota, College of Dentistry, a statistical investigation, under the direction of Dr. Peter J. Brekhus, based on the examination of upwards of 25,000 mouths, has fixed the age of about twenty as the time when dental caries is most prevalent, and the teeth most frequently lost by dental caries are the first molars. A preliminary report was published by the University Press in 1928.

Based on these findings a study is in progress to determine how best to prevent and alleviate this condition produced by dental caries.

SUMMARY OF RESEARCH IN SPECIAL BUREAUS AND INSTITUTES

No summary of Minnesota research during the past ten years can be complete without at least limited reference to the very unusual work done in a number of special institutes and bureaus whose affiliation with the University is close and constant, although they are not integral parts of any college organization.

Notable in this group is the Child Welfare Institute, which has operated at the University under a special grant from the Laura Spelman Rockefeller Memorial Fund since July 1, 1925. Under the direction of Dr. John E. Anderson and his associates,

a series of unique and extremely useful studies have been made of the habits and actions of children of pre-school age, and the projection of these researches to their logical conclusions has involved contributions in many related fields. Pioneer work in parental education also has been done by this institute.

The Municipal Reference Bureau and the various research groups functioning in affiliation with it, under the direction of Mr. Morris Lambie, have demonstrated repeated usefulness in solving problems of immediate importance to the people of the state of Minnesota—problems whose ultimate adjustment has been greatly facilitated by the existence of this unique agency in a position to approach even controversial problems on a basis of “less heat—more light.”

COLLEGIATE EDUCATIONAL RESEARCH AT THE UNIVERSITY OF MINNESOTA

COMMITTEE ON EDUCATIONAL RESEARCH

President Coffman on January 8, 1924, created a special committee to give further consideration to "personnel and related educational research." In his report for 1925-26 President Coffman wrote of this committee as follows:

"Perhaps one of the most significant things that has been done at the University of Minnesota in many years has been the study of a number of university problems by a special faculty research committee appointed by the president. This committee is known as the University of Minnesota Committee on Educational Research."

The personnel of this committee which has been continuous since that date was as follows:

- Mr. F. Bass, professor of municipal and sanitary engineering, chairman,
Department of Civil Engineering
- Mr. G. W. Dowrie, dean of the School of Business Administration and professor of economics
- Mr. G. S. Ford, professor and chairman of the Department of History,
dean of the Graduate School
- Mr. Everett Fraser, dean of the Law School
- Mr. Edward M. Freeman, chief and professor, Division of Plant Pathology
and Botany and dean of the College of Agriculture, Forestry, and
Home Economics
- Mr. Melvin E. Haggerty, chairman, dean of the College of Education, professor of educational psychology
- Mr. John B. Johnston, dean of the College of Science, Literature, and the
Arts, and professor of comparative neurology
- Mr. F. J. Kelly, dean of administration and director of the Summer Session
- Mr. Ora M. Leland, dean of the College of Engineering and Architecture,
and of the School of Chemistry
- Dr. Elias P. Lyon, dean of the Medical School, professor and director,
Department of Physiology
- Dr. Alfred Owre, professor and dean, College of Dentistry
- Mr. Donald G. Paterson, professor of psychology
- Mr. R. E. Scammon, professor of anatomy
- Dr. Louis B. Wilson, director of administration and pathology, Mayo
Foundation

Throughout the more than six years since its appointment the committee has continued to function. Its personnel has remained unchanged except for resignations from the university faculties. Appointments to fill vacancies created by such resignations have been made as follows:

Russell A. Stevenson, dean of the School of Business Administration who took the place of Dean G. W. Dowrie; James Lawrence, assistant to the president who took the place of Dean F. J. Kelly; W. F. Lasby, dean of the College of Dentistry who took the place of Dean Alfred Owre.

INADEQUACY OF COMMITTEE METHODS

Very early in the life of the committee, it became apparent that the procedure usual in committee deliberations would be unsatisfactory as a program of procedure. From the number and variety of problems at once suggested for investigation it was evident that too heavy a draft of time on the members of the group would be entailed should the entire group essay to examine each problem in turn. This difficulty suggested the enlistment of other members of the university community in the study of problems with which they might be particularly competent to deal. From the very beginning the practice developed of creating special committees to examine particular issues and prepare reports and memoranda for the use of the general committee.

A more serious limitation of committee methods in dealing with educational problems at once protruded itself. The general outcome of such methods is a composite and agreed-upon recommendation. They do not in the usual course of things develop new knowledge. Valuable as committee conclusions may be when immediate administrative action is imperative, it is clear that many of the problems of higher education are enveloped in ignorance and only the discovery of new facts will lead to a satisfactory solution. Such a condition indicates the need for research and experimentation. The result has been that the committees invited to examine the special issues have in general tended to become committees in charge of projects in educational research, with one or more competent individuals, frequently a graduate student, assuming immediate responsibility for experimental work.

Through this means the number of persons directly and in-

directly connected with the work of the committee has been greatly enlarged. Approximately a hundred members of the faculty have been identified with one or more research projects. As these committees have been formed they have usually contained one or two men from education and from three to ten instructors from other departments of the University, the majority always lying with non-education faculties. The individuals have been drawn from the professional college groups as well as from the liberal arts college. The names of these departments will give a vivid picture of how widely interest has been distributed. They are as follows:

Administration	Mathematics
Agriculture	Mechanics
Anatomy	Municipal and Sanitary Engineering
Biochemistry	Nervous and Mental Diseases
Botany	Nutrition
Business	Obstetrics and Gynecology
Chemical Engineering	Pathology
Chemistry	Pediatrics
Civil Engineering	Physical Education
Dentistry	Physics
Economics	Physiological Chemistry
Educational Administration	Physiology
Educational Psychology	Plant Pathology
Elementary Education	Political Science
Engineering	Psychology
English	Romance Languages
History	Secondary Education
Home Economics	Sociology
Journalism	Speech
Law	Surgery
Library	University Health Service
Marketing	Zoology

The enlistment of competent members of the university faculties in the study of educational problems is valuable not merely because it increases the number of interested students, but even more because it brings to bear upon educational problems methods of investigations which have had their greatest development in fields other than education.

Education has done less than some suppose in the creation of new scientific methods, but has levied extensively upon the devices and methods of other fields of investigation. The method of

documentary study has been developed in history; the questionnaire and measurement methods had earlier extended use in psychology; the case method is a contribution of psychology and sociology; the physical sciences and later biological sciences including psychology have made available various procedures in experimental analyses; economics and sociology are responsible for procedures in investigation that have been widely appropriated; while mathematics has long been the useful handmaiden of scholarly study in many fields.

The manner in which these methods shoot across the intellectual interests of a university faculty is fairly clear from the mere listing of them. Our Minnesota experience has given us copious illustration of their pervasive character in educational investigation. At one time or another during a six-year period we have had the assistance of men and women from many academic fields who have enriched our understanding, not merely of the problems to be studied, but also with clear perceptions of the applicability of methods which they knew better than did we. The naming of the individual departments is in itself suggestive, and it may here be stressed that inquiring minds are not confined to any college or university department.

During the six years from 1924 to 1930, the committee has functioned in the manner described above. The actual work of carrying forward investigations has been largely assumed by graduate students pursuing work for advance degrees. The arrangement has made possible the collection of much material for theses that would have been difficult or impossible without the widespread and always generous support of the special committees and the faculties which they represent. At the same time the advanced students have given to the committees the expert aid and concentrated services which the committees have needed to prosecute the studies they have sponsored. The resulting program has been one of genuine co-operation not merely to the mutual advantage of the graduate students and the several committees but also to the welfare of the whole University.

Among the studies that have been completed are the following:

1. The study of the special committee on *Class Size at the University Level*, with Professor Earl Hudelson as chairman. This investigation, which began in 1924, has been carried on from

year to year since that date. Up to the time of publication of the initial volume the experiment had involved 59 fully or semi-controlled experiments participated in by 106 classes under 21 instructors in 11 departments in 4 colleges of the University. At that time the experiment had involved 5,879 students, 4,025 in large classes and 1,854 in small classes. Direct man-to-man comparisons had been made upon 1,288 pairs of students carefully matched as to intelligence and scholarship. The final criterion of effective instruction was student achievement as measured by tests and examinations, most of which were objective. Conclusions: Since small classes, other things being equal, greatly increase cost of instruction, they must be justified on other grounds. In the light of the consistent results of this investigation, it would seem that it will be extremely difficult to justify them on the ground of superior student achievement.

2. The study of the special committee on *Problems of Science Teaching at the College Level*, with Mr. A. W. Hurd acting as secretary of the committee. This includes first of all a summary of all experimental work on problems of science teaching at the college level up to the date of publication (1929). In addition there are reported three studies conducted in the Medical School as follows:

- a. Techniques of teaching anatomy.
- b. Laboratory versus library in the teaching of human physiology.
- c. The effective reduction of time given to laboratory in human physiology.

The major portion of the report is given to studies in the Department of Physics as follows:

- a. A study of the measurement of instruction in mechanics.
- b. A study of the best method of pairing students for educational experiments.
- c. Group comparisons in mechanics.
- d. Study of student opinion regarding courses in mechanics.
- e. The development of prognostic and achievement tests in mechanics.
- f. A study to determine the effect of class size in the teaching of physics.
- g. An analysis of the possible determinants of achievement in college physics.

3. The study on *Curricular Problems in Science at the College Level*, by Palmer O. Johnson. This is a report of a three-year investigation of the place of elementary botany as a prerequisite course for sequent courses in the College of Agriculture, Forestry, and Home Economics. The study covers an analysis of botany courses, past and present, in the University of Minnesota, directed to discover the relationship between elementary botany and courses which require elementary botany as a prerequisite. A detailed and comprehensive analysis has been made of the elementary course with special reference to the elements of this course which are assumed in later courses and the determinant of the content of elementary botany as a prerequisite. A second section of the report is an experimental study of the permanence of learning in elementary botany. The final section deals with the influence of certain factors upon achievement in general botany including an evaluation of previous preparation in high school science, student interest, sex, and intelligence.

4. *Laboratory Instruction in the Field of Inorganic Chemistry*, by Victor H. Noll. This is an experimental study to determine the influence upon achievement of a modification of the amount of laboratory instruction required in elementary courses in college chemistry. The investigation covered approximately four years during which time various sections were submitted to experimental study. The study covered the following main divisions:

- a. Evaluation of individual laboratory work as compared with other methods of instruction, such as oral quizzes, recitations, and outside reading.
- b. Comparisons of achievement of groups having different amounts of laboratory work.
- c. Techniques of measurement in elementary courses in college chemistry.

The following conclusions may be noted:

As far as any measures used in this study are concerned, two hours of laboratory work out of five per week do not seem indispensable. The fact that students can be deprived of these two hours without significant loss would appear to be rather important evidence on this point. As for substitutes for laboratory work, of the two that were tried, recitation, or oral quiz, seems to be a fairly profitable substitute, but outside reading does not. It may be that a different plan for the outside reading or a different selection of topics would show results different from those found here.

Oral quiz and recitation seemed to be somewhat more effective than laboratory work during the experimental period and apparently the salutary effect carried over to sequent courses. This seems to be a rather important fact from the administrative point of view. It needs further experimental verification before being accepted unqualifiedly.

With two of the experimental groups compared, a follow-up study was made of the achievement of these groups in sequent courses in chemistry over a period of two quarters. There was no evidence in this study to show that the group that had been given one hour of recitation in place of two hours of laboratory work had lost anything because of this substitution.

5. *Medical School investigation.*—A co-operative investigation in problems of instruction in the Medical School has been under way for more than a year. Three studies have already been completed.

- a. A detailed analysis of the entire content of the courses in physical laboratory diagnoses. The method used here follows that developed by Dr. Peik in the study of the courses in education, and the work was done by Dr. Kellog F. Bascom, a graduate of the Medical School and now located at Minot, North Dakota.
- b. An analysis of the activities of the student clerkship in pediatrics. This work was done by Mr. Norman W. Anderson, M.B., from the University Medical School and now interne in the Letterman General Hospital, San Francisco. The study covers the following items:
 - (1) An analysis of all clinic materials available during the calendar year of 1929 in the University Hospital.
 - (2) An analysis of all the clinical material available in the calendar year of 1929 in the Minneapolis General Hospital.
- c. An analysis of all use made of clinical material in the University Hospital during a portion of the calendar year 1929. The above analyses show by calendar days and in reference to the clerkships of particular students, the kinds of clinical material available for instructional purposes, and also that used. It also reveals certain unused materials.
- d. An analysis of the student clerkship activities in the field of pediatrics based upon hour-by-hour diaries of an entire group of students in a particular clerkship.

- e. An analysis of clinical material and clerkship activities in the clinical instruction in medicine. This study was conducted by Dr. Arthur D. Klein, M.A., M.D., from the University Medical School and now interne in St. Luke's Hospital, Chicago. This study covers the following items:
- (1) An analysis of the clinical material available in the field of medicine during the calendar year at the University Hospital.
 - (2) An analysis of the clinical material available in the field of medicine during the calendar year at the Minneapolis General Hospital.
 - (3) An analysis of student clerkships based on hour-by-hour diaries of the students.

6. *Experimental Studies of the Reading Abilities of College Students*, by A. C. Eurich. During the past two years, five reading experiments have been conducted. For each of these experiments practice and control groups were organized among the classes in freshman composition. In the first two experiments the practice groups were given special drills in reading, vocabulary, and study. In the last three experiments the drills were confined to vocabulary. The results are consistent in showing definite improvement in the specific materials on which drill was given. In general reading ability or in general vocabulary, however, the improvement observed appears to be only temporary.

The following studies are under way but not completed:

1. The evaluation of laboratory instruction in physics. This study is being carried forward by Mr. Henry Duel under the direction of the subcommittee on the teaching of science. Preliminary experiments have been tried out and arrangements have been made for the beginning, in the autumn quarter of 1930, of an experimental program in which certain sections will be given laboratory instruction and certain sections will be taught physics without the laboratory. The program involves preliminary testing in subject-matter, intelligence, and in the "elaborate measure of scientific attitude." Following the period of instruction, tests designed to measure changes in these matters will be given. This experiment is looked upon by science teachers as an energetic attempt to evaluate the influence of laboratory instruction in producing changed attitudes on the part of students receiving such instruction. The problem is a crucial one, since teachers in gen-

eral look upon the laboratory as designed to provide training in the creating of proper attitudes not merely toward the phenomena studied, but in the more general field.

2. An experiment to evaluate extensive and intensive reading of essays. The purpose of this experiment is to compare experimentally two methods of studying essays in a course in freshman composition. One method involves intensive reading and study, while the other involves more extensive reading. The general plans are that two groups of freshmen, one to be designated as the experimental group and the other to be known as the control group, should be taught by different methods. The procedure of the controlled sections will be essentially the same as that now followed in freshman English instruction while the experimental group will be taught according to a special method involving the intensive examination of a limited number of essays.

3. An experiment in human physiology, by V. H. Noll. This experiment attempts to measure the effect on achievement of required attendance at bi-weekly oral quizzes and of grading students in laboratory work. Two groups were formed, one taking the course of lectures, quizzes, and laboratory as usual, the other group being excused from quizzes and not graded on laboratory work. Both groups were given the Miller Analogies Test at the opening of the fall quarter. Achievement was measured by a final laboratory examination and a comprehensive examination taken by all medical students at the end of each school year.

4. A study of the honor point ratios of home economics students to determine their prognostic value, by Louise Keller. Records in the registrar's office at the University of Minnesota for 2,200 home economics students (1918-28), the psychological test ratings for a portion of this number, and the ratings in student teaching for 237 students were analyzed. The study is designed to discover the prognostic value of the future success of honor point ratios of freshmen, the differential factors for students transferring from other institutions and for those entering the University of Minnesota as freshmen, the character of students not graduating, etc.

5. A study of the relation of intelligence, marks in academic and professional courses, and success in practice teaching, by Sister Mary Helen Kranz. This study is designed to discover the prognostic value of intelligence test ratings, honor points re-

ceived in professional subjects, and relative standing in educational psychology with special reference to success in the student teaching of these students.

6. A study in industrial chemistry. A study of achievement in industrial chemistry, preparatory to a rearrangement of courses based on a comparison of new arrangements with the old. Industrial chemistry heretofore was given in the senior year together with the more theoretical course in physical chemistry. The change contemplated is to make industrial chemistry a junior subject, leaving physical chemistry a senior subject. The lecture course is to precede the laboratory course, though they are given in unit processes at the present time. The educational project is to evaluate the two sets of procedures, i.e., the present and the contemplated, the results of the evaluation determining which is preferable.

7. Studies in the utilizing of radio in educational matters. The University of Minnesota and other educational institutions now make more or less extensive use of broadcasting for educational purposes. It is obvious that some evaluation of various broadcasting activities should be made with a view to directing the University's activities into the most effective channels. With this in mind, as well as with a view to studying the broader problems of radio in education, a committee has been created for the purpose of investigating these problems. Dr. John E. Anderson has consented to act as chairman of this committee and to lead it in methods of investigation. The other members of the committee are as follows: J. M. Bryant, Oscar Burkhard, Robert Lansing, W. A. O'Brien, and T. A. H. Teeter.

8. Instructional problems in engineering mathematics. A study initiated to determine the effectiveness of instruction in classes of different sizes but necessarily extended to include problems of student elimination, standards of promotion, abilities and preparation of engineering freshmen. This study is being extended during the year 1930-31 by Professor Frank Lindsay.

9. A study of the effect of individual laboratory work in a one-quarter course in mechanics upon scientific aptitude, by Henry Duel. Two groups were formed, one having two hours per week of individual laboratory work, the other having no laboratory work. The groups were given a pretest in mathematics, a series of weekly quizzes, and a two-hour final examination. In addition,

the groups were given the Zyve Test of Scientific Aptitude at the beginning and at the end of the course.

10. Qualities and activities of superior college teachers. This investigation was devised with a view to making an objective analysis of the qualities and activities of superior college teachers. A large committee was arranged for and Dr. Frank W. Lathrop spent the major portion of one year studying the literature and devising an experimental method of recording instructional activities.

The foregoing list of studies completed or under way is offered as an illustration of more than forty different studies of problems concerned with teaching that have been made or initiated during the last ten years.

PUBLICATIONS OF THE FACULTIES

A list of the publications of the faculties of the University of Minnesota, for the period from July 1, 1928 to June 30, 1930, is published as Volume XXXIII, No. 43, of the University of Minnesota Bulletin Series.

INDEX

	Page		Page
Absence, leaves of	151-56	Agriculture, Forestry, and Home	
Academic fraternities. <i>See</i> Fra-		Economics, College of (con-	
ternities.		report of dean (continued)	
Academic Interfraternity Council.		faculty	275
<i>See</i> Interfraternity Council.		Federal Farm Board	272
Academic sororities. <i>See</i> Sorori-		junior colleges	274
ties.		personnel of student body	274-75
Administration and Finance,		registration in	272-73
Commission of. <i>See</i> Commis-		schools	275-76
sion of Administration and		specialization	273
Finance.		research problems, unsolved	76-78
Administration, changes in	17-18	sectional work	279-82
simplified	27-28	boys' and girls' club work	280-81
Administrative actions	111-23	county agent work	279-80
officers, reports of	263-450	home demonstration work	280
Administrative Committee of the		short courses	251, 281-82
Senate. <i>See</i> Committee.		summary of research	454-62
Admission to bar	283-85	butter composition and	
Adult education. <i>See</i> Education.		standardization	454-55
Advanced standing, students of.		checking wheat rust	460
<i>See</i> Students.		control of pests	459-60
Advantages of a university. <i>See</i>		fruit breeding	458-59
University.		phosphorus deficiencies ..	455-57
Advantages of Northwest region.		protein investigations ...	461
<i>See</i> Northwest region.		ripening fruits and vege-	
Aeronautical engineers. <i>See</i>		tables	462
Engineering and Architecture,		treatment for milk fever	455
College of.		winter-hardy plants	462
Agricultural campus		All-University Council	397
floor space in buildings	47	Alumni	
improvement of	179	Association	35
land needs of	51-52	co-ordination of University with	31-35
Agricultural Economics, Depart-		distinctions of	71
ment of	114	in Medical School	295
summary of research in	477-79	organization in engineering ..	270
Agricultural Experiment Station	276-77	report of secretary	427-28
problems	276-77	advisory committee	427
progress	276	alumni board	427
support necessary	277	alumni directory	428
Agricultural Extension Division.		<i>Alumni Weekly</i>	116, 427-28
<i>See</i> Division of Agricultural		American Association of Col-	
Extension.		leges of Pharmacy. <i>See</i> Phar-	
Agricultural short courses...251, 281-82		macy, College of.	
Agriculture, Forestry, and Home		American Bar Association	
Economics, College of		resolutions of committee	283-84
report of dean	272-82	American Chemical Society	271
agricultural extension	277-78	American Federation of Labor..	80
finances	277-78	American Medical Association.	
personnel	278	<i>See</i> Pharmacy, College of.	
agricultural situation	272	American Men of Science, fac-	
co-operative courses	273	ulty members listed	36
experiment station	276-77		

	Page		Page
American Pharmaceutical Association. <i>See</i> Pharmacy, College of.		Boardman, Dr. Charles W., principal, University High School	329
Anatomy, Department of		Board of Education	33
research in	513-14	Board of Regents	
Anderson, John E., report of	437-44	action of	18, 51, 55, 111-17
Anthropology, Jenks Expedition	34	and Law School requirements	289
Appleby, W. R., report of	312-17	selection of, in various institutions	88-92
Applications for fellowships,		selection of members at Minnesota	87-88
Mayo Foundation	349	Book store	
Appointments on staff	143-59	W.S.G.A., second hand	387
Appropriations. <i>See</i> Funds.		Books	
Aptitude tests	14-15, 266	gifts	106, 107
Arabs	397	use of	413
Architecture, School of. <i>See</i> Engineering and Architecture, College of.		Botany, Department of	
Arthur Upson room	33	summary of research in	463-65
Artists' Course at University.		Brooke, W. E.	18
<i>See</i> University.		Buildings	
Assistants to president. <i>See</i> President.		completion and improvement of	177-79
Association of American Universities	265	increase in floor space	10, 46-48
Association of Minnesota Colleges	73	insurance of	111-12
Athletics		new	9, 48-49
directorial change in	376	urgent need for more	51, 71
high school	376	Buildings and grounds	173-79
intercollegiate	94-95, 375	Buildings and Grounds Committee. <i>See</i> Committee.	
intramural	373	Bureau for Research in Government	
receipts and attendance,		report of director	429
1928-30	374	Bureau, Municipal Reference.	
revenue from	245	<i>See</i> Municipal Reference Bureau.	
solicitation of students for	74	Bureau of Municipal Research	28
teachers training course in	373-74	Bureau of Recommendations	
Auditorium. <i>See</i> Cyrus Northrop Memorial Auditorium.		candidates placed	337
		registration fee	337-38
		registrations and placements	337
		service fee	115
		Bureau of Social Hygiene of New York	11, 445
Bacteriology, Department of		Business Administration, School of	
summary of research	514-18	report of dean	353-54
antiseptics	518	co-operative work	354
diseases in carnivorous animals	516	curriculum	353
effects of surface tension on bacteria	514-15	teaching burden	353
electrical conductivity of bacterial cells	516	research	354, 479-85
morphologic variation and life cycles in bacteria	515-16	business cycles	479-80
physiology of bacteria	517-18	corporation finance	481-82
pneumonia serums	515	general economics	481
tularemia	517	labor	482-83
vaccine	515	marketing and market prices	480-81
Biochemistry, Division of		public finance	484-85
research in	461	regional economic studies	483-84
Biophysics, section of	522	statistics	481
Blitz, Anne Dudley, report of	385-93	research problems, unsolved	78
		Butzerin, Eula B., report of	298-99

INDEX

543

	Page		Page
Cadet Officer's Club	383	Committee (continued)	
Campus		of Seven	12-14
development of	45-52	on Co-ordination	54-55
farm. <i>See</i> Agricultural campus		on Professional Training of	
improvement of	176-79	College Teachers	339-43
Central Northwest Regional Sur-		Students' Work	367-68
vey Committee. <i>See</i> Committee.		Comprehensive Building Fund..	48-49
Certificates, General Extension..	357	Comptroller, report of	241-60
Chaperonage	392	detail of revenue—student fees	248-49
Chemical symposiums	271	sales and miscellaneous	252-58
Chemistry, School of		statement of expenditures	246-47
laboratory fee	116-17	statement of revenue	244-45
report of dean	271	student enrolment	250-51
American Chemical Society	271	student loans	259-60
chemical symposium	271	Congress, grants of, to Univer-	
instruction	271	sity	67-68
research problems, unsolved...	78	Consumer and Changes in Meth-	
summary of research	503-11	ods of Distribution of Con-	
current investigations	511	sumer Goods	26
Child Welfare Institute		Convocation	127-29
report of director	437-44	summer session	369
infant studies	440	Co-operation of colleges. <i>See</i>	
instruction	440-41	University.	
miscellaneous activities	444	Co-operative cottages	387
nursery school and experi-		Co-operative research	25-28
mental kindergarten	437	Co-operative work, School of	
parent education	441-42	Business Administration	354
projects	439-40	Co-ordination, Committee on. <i>See</i>	
publications	443	Committee on Co-ordination.	
research	437-39	Corporation, Greater University.	
study group topics	442-43	<i>See</i> Greater University Corpor-	
Rockefeller memorial	10-11	ation.	
summary of research	525-26	Correspondence study	358
Christian, Mrs. George Chase..	11	Counsel for students. <i>See</i> Stu-	
Citizens Aid Society	11, 70	dents.	
Civil Engineering Summer Sur-		Counselor for women. <i>See</i>	
veying Camp		Vocational Counsel for Women.	
fee charge	115	Court ruling	
Classes, size of	42	admission to bar	285
Clinics. <i>See</i> Medical School.		Board of Regents' suit	117-19
Code of University Laws and		Crippled Children's Hospital. <i>See</i>	
Regulations. <i>See</i> University.		Minnesota Hospital and Home	
Coffey, W. C., report of	272-82	for Crippled Children.	
Coffman, L. D. <i>See</i> President.		Curriculum	
Colleges		Agriculture, College of	273
advantages of small over larger	42	Business Administration, School	
Commission of Administration		of	353
and Finance	31	Dentistry, College of	310
recommendations	92	experiments with	55-57
Committee		progressiveness of	74, 265
Administrative, of the Senate	28, 33-34	Public Health Nursing	299
Alumni Advisory	427	Science, Literature, and the	
Buildings and Grounds	112-13	Arts, College of	265-68
Central Northwest Regional		Cyrus Northrop Memorial Audi-	
Survey	475-76	torium	
Educational Guidance	267	availability	129
Educational Research		erection of	10, 33, 111
.....17, 25-27, 527-37			

	Page		Page
Dad's Day	35, 132, 400	Dentistry, College of (continued)	
Dairy Husbandry, Division of,		report of dean (continued)	
research in	454-55	curriculum	310
Dean of student affairs, report		dental hygienists	310
of	395-402	extension courses	310
Dad's and Mother's days	400	faculty activities	310-11
foreign students	395-96	graduate courses	310
fraternities	398-400	library	310
Householders' Association ...	401	research work	311
Interfraternity Council	400-401	summary of research	525
loans through the office of ...	402	dental caries	525
publications	397	study of pyorrhea	525
scholastic comparison	398-400	Department of Agriculture. <i>See</i>	
student councils	397	Agriculture, Forestry, and	
student organization finances..	396-97	Home Economics, College of.	
Tutoring Bureau	401	Development of Northwest. <i>See</i>	
Senior Adviser Bureau ...	401-2	Northwest region.	
Dean of women, report of	385-93	Diehl, H. S., report of	403-12
absences of women students..	385-86	Dispensary report. <i>See</i> Univer-	
chaperonage	392	sity Hospital and Dispensary.	
delinquents	385	Distinctions conferred on faculty	133-39
employment	385	Division of Agricultural Exten-	
financial aid to students	392-93	sion	277-78
scholarships	393	Division of Library Instruction.	
housing	386-87	<i>See</i> Library Instruction, Divi-	
co-operative cottages	387	sion of.	
rooming and boarding houses	387	Dramatic organizations	397
Sanford Hall	386	Druggists' Research Bureau. <i>See</i>	
summer school	387	Pharmacy, College of.	
residences of women students	385	Edison, Thomas A., scholarships	
Shevlin Hall	392	of	75
sororities	391-92	Education	
women's organizations	387-92	adult	79-83, 355-56
Women's Athletic Associa-		advisers and counselors in...	333
tion	390-91	Board of	33
Women's Self-Government		conference on legal	284-85
Association	387-89	co-operation in	52-54
Young Women's Christian		increase of interest in	43-44
Association	389-90	parent	441-42
Deaths	164-72	physical, for men	371-76
Degrees		physical, for women	377-82
number conferred	194-95, 265	reorganization of	57-58
Delinquents among women stu-		Education, College of	
dents	385	report of Committee on Pro-	
Demonstration school	334-37	fessional Training of College	
agreement	334-36	Teachers	339-43
administrative control	334	action at Iowa	343
informal observance of work	335	educationists' contribution..	340-41
student teaching	335	faculty record form	341-42
teaching, demonstration ...	336	groups interested	339-40
university teaching	336	mission of committee broad-	
purpose of	336-37	ly defined	341
Dentistry, College of		University of Chicago	342-43
reduction in summer session		willingness to improve	342
fee	116	report of dean	329-39
report of dean	310-11	alumni dinner	330
building	311		

	Page		Page
Education, College of (cont.)		English, Department of	
report of dean (continued)		summary of research	462-63
Bureau of Recommendations	337-38	Enrolment. <i>See</i> Registration.	
celebration of founding	329-30	Entering students. <i>See</i> Students.	
program	329-30	Entrants from secondary schools.	
counselors	333	<i>See</i> Students.	
demonstration school	334-37	Eustis Hospital. <i>See</i> Minnesota	
federal investigation of teach-		Hospital and Home for Crip-	
er preparation	338-39	pled Children.	
growth	331	Eustis, William Henry	10, 70
<i>Minnesota Mentor</i>	330-31	Exhibits, Museum of Natural	
Peik study	338	History	417
research and publications ..	333	Experiment stations	61-62
student guidance	331-32	Minnesota. <i>See</i> Agricultural	
guidance monograph	332-33	Experiment Station.	
personnel records	331-32	School of Mines	312-13
report	332	Extension Division. <i>See</i> General	
survey by Dr. Engelhardt...	338-39	Extension.	
University high school	334	Extension students. <i>See</i> General	
research problems	79	Extension.	
Educational Guidance, Commit-		Faculty	
tee of, for Freshman Week.		appointments	143-50
<i>See</i> Committee.		changes in	141-72
Educational program		deaths	164-72
changes in	52-60, 265-68	honors conferred upon.....	133-39
research	527-37	in Agriculture, College of....	275
Educational Research, Commit-		in Dentistry, College of....	310-11
tee on. <i>See</i> Committee.		in Law, School of.....	286-87
Eitel, Dr. George C.	11	insurance, plan for.....	33
Emmons, W. H., report of	415-16	leaves of absence.....	151-56
investigations of	469-70	Mayo Foundation	349
Employment Bureau		members in <i>Who's Who</i>	36
co-operation with dean of		promotions of	156-60
women	385	relations with students.....	11
report of director	430-32	reorganization of	59
employment situation	430	resignations of	160-64
patrons on list	432	retirement of	164
research for	430-31	retirement, plan for.....	33, 75-76
services of	430	understanding of students....	268
table of employment	431	Woman's Club and University	
Endowment of state. <i>See</i> State.		Hospital	300, 307
Engelhardt, Dr. Fred		working and living conditions	33
research relative to Boards of		Farm campus. <i>See</i> Agricultural	
Regents	88-92	campus.	
survey by	338-39	Farm Management and Agricul-	
Engineering and Architecture,		tural Economics. <i>See</i> Agri-	
College of		cultural Economics.	
civil engineering		Farms and farmers	38-39
special courses and fees....	115	decline of rural population...	80
report of dean	269-70	education of farmer.....	83
alumni organization	270	Federal Farm Board.....	272
amount of instruction	269	Federal Government. <i>See</i> Gov-	
engineering, aeronautical ..	269-70	ernment.	
increase in enrolment	269	Fees	
new courses	269	changes in	35, 114-17
research problems, unsolved..	78	civil engineering summer sur-	
summary of research in	503-11	vey camp	115
current investigations	511		

	Page		Page
Fees (continued)		Four-Year Law Course (con-	
General Extension	357	tinued)	
registration for Bureau of		increased requirements	289
Recommendations	337-38	law as mental discipline.....	291-92
revenue from	245, 248-49	limited curricula of school....	290-91
Fellowships		preparation of faculty.....	292
as gifts	95-106	research in law	291
personnel, Mayo Foundation..	351	Fraser, Everett, report of.....	283-93
Fesler, Paul H.		Fraternities	
report of	299-300	analysis of scholarship	425-26
admission of patients.....	300	pledging rules	112
extension of services.....	300	professional, rating of	399
improvement of all depart-		scholarship of	424-25
ments	300	scholastic comparison	398-400
needs	300	training of pledges	423-24
staff commended	300	Freshman, courses of study for	267-68
superintendent, University Hos-		personnel	400
pital	296	Funds	
Field House		allocation of	60-62
financing of	113	appropriation of state.....	62
size of	48	distribution of government...	62
Field, Oliver P., report of....	429	from athletics	245, 374
Field secretary and General		legislative, 1929	92-93
Alumni Association		need for	64-65
report of secretary.....	427-28	permanent support	67-68
additional activities	428	statement of revenue	244-45
Alumni Advisory Committee	427	trust, purpose of	70-71
meeting of	427	Future of the University. See	
alumni and other meetings	427	University.	
alumni board	427-28	Gale, Mrs. E. C.	11
directors of	427	General Alumni Association. See	
alumni directory	428	Alumni.	
Medical School alumni..	428	General Education Board.....	33
<i>Alumni Weekly</i>	428	General Extension	
subscriptions	428	advertising	74
Finances		agricultural division of.....	28, 277-78
Agricultural extension funds..	277-78	course for physicians.....	295-96
Minnesota Union	435-36	dental courses in	310
Museum of Natural History..	421-22	enrolment	191-92, 251
origin of university support..	35	report of acting director....	355-67
report of comptroller.....	241-60	adult education	355-56
Social Hygiene Bureau.....	445-46	certificates	357
state's endowment	64-70	classes in	356-57
student organization	396-97	correspondence study	358
Fletcher, Henry J.	287	department of	355
Folwell, William Watts		educational enterprises	355-56
resolutions of University Sen-		high school music contest..	358-60
ate	164-66	Municipal Reference Bureau	360-63
Ford, Guy Stanton, report of..	344-48	radio programs	363
Foreign students		radio report	364-67
in Graduate School	348	short courses	357
in Mayo Foundation	349	research problems	79
number advised	395	revenue from students.....	249
number of	396	social hygiene course for par-	
Four-Year Law Course	289-93	ents	447
administration of law.....	290	students in	183-84, 191
development of four-year pro-			
gram	292-93		

	Page		Page
Geographical distribution of students. <i>See</i> Students.		Hennepin County Medical Association. <i>See</i> Pharmacy, College of.	
Geography, Department of		Hester, Major John H., report of	383
summary of research	502-3	High School	
Geological Survey, report of....	415-16	aptitude tests for seniors...14-15, 266	
geological map of Minnesota... 416		athletics	376
mapping of pre-Cambrian rocks 415-16		co-ordination of University with	12
marl resources of state..... 415		entrants from	196-216
petrography of the Rove slate 415-16		guidance of students..... 265-66	
stratigraphy of Paleozoic formations	415	University. <i>See</i> University	
Geology and Mineralogy, Department of		High School.	
summary of research in..... 468-71		High school music contest..... 358-60	
colleges making contributions 468		History, Department of	
study of granite areas..... 469		summary of research in..... 485-90	
study of ore deposits..... 469-70		Honor point system..... 264	
theory of oxidation and leaching of iron formations	470	Honors to members of staff. <i>See</i> Faculty.	
survey by	28	Horticulture, Division of	
Gifts		research in	457
private	70-71	Householders' Association	401
to Museum	418-19	Housing Bureau	
to University	10-11, 95-108	inspection of houses..... 387	
<i>Gopher</i>		Housing of woman students... 386-87	
financial status of..... 396-97		How To Study Course..... 266	
<i>Gopher Business News</i> 397			
<i>Gopher Countryman</i>	397	Improvement of campus..... 176-79	
Government		Improvement of college teaching 17-25	
aid to University	245	Industry, mechanization of..... 79-81	
allocation of funds..... 60-62		Infant studies	440
Bureau for Research in..... 429		In-Patient Department. <i>See</i> University Hospital and Dispensary.	
investigation of teacher preparation	338-39	Institute of Child Welfare. <i>See</i> Child Welfare Institute.	
Graduate School		Institutions	
courses in dentistry	310	leadership of private..... 71-74	
report of dean..... 344-48		private and University..... 40, 61	
classification of students.... 347-48		Instructors. <i>See</i> Faculty.	
increase in registration..... 344		Insurance plan for faculty..... 33	
lack of skilled teachers.... 345-46		Intercollegiate Athletics. <i>See</i> Athletics.	
problem of teaching graduates	346	Interfraternity Council	
qualifications of graduates.. 344-45		action of	112, 400-401
work in medical subjects.... 297		report of president	423-26
work in pharmacy	321	analysis of scholarship..... 425-26	
Graduate study centers..... 65		Minnesota Co-operative Buyers' Association, Inc. 426	
Graduates	130	scholarship	424-25
Greater University Corporation. 111		training of pledges..... 423-24	
Grants of Congress to University 67-68		Interim Commissions	30
Growth of University. <i>See</i> University.		establishment of	93-94
		Intramural athletics. <i>See</i> Athletics.	
Haggerty, M. E., report of.... 329-39		Investigation of teacher preparation	338-39
Harding, Margaret S., report of 448-50		Investigations. <i>See</i> Research.	
Health Service. <i>See</i> University Health Service.			

	Page		Page
Jenks, A. E., investigations....	34	Legislature	
Johnson, Dorothy G., report of	430-32	appropriations, 1929	92-93
Johnson, Dr. Palmer O.	19	approval of building program	45-46, 50
Johnston, J. B., report of.....	265-68	Interim Commission	30, 93-94
Journalism, Department of		support of fund for University	67
laboratory fee charge.....	115	Leland, O. M.	
Junior colleges	57	report, College of Engineering	
desirability of	43-44	and Architecture	269-70
expansion of movement for...	44	report, School of Chemistry ..	271
policy of, and College of Agri-		Library	
culture	274	law	286
support of	44	report of librarian	413-14
Knappen, Theodore M.	80-81	accumulation of work	414
Laboratory work in natural		catalog department	413
sciences. <i>See</i> Natural sciences.		growth and use of library..	413
Land and buildings.....	175-79	trust fund	414
Land-Grant College Survey. <i>See</i>		research problems, unsolved..	79
Survey.		service, Municipal Reference	
Land Management Short Course	281	Bureau	362
Land, need for	51-52	Library Instruction, Division of	113, 384
Land Valuation Short Course..	282	report of librarian	384
Lasby, W. F., report of.....	310-11	enrolment	384
<i>Laws and Regulations of the</i>		satisfactory results	384
<i>University</i>	115-16	Life at University. <i>See</i> Univer-	
Law, School of		sity.	
expansion and reorganization		Living and working conditions of	
of	57	students. <i>See</i> Students.	
Four-Year Law Course	289-93	Loans	
administration of law	290-91	administered through dean of	
better lawyers produced....	293	student affairs	402
increase in faculty necessary	293	administered through dean of	
purpose of	292	women	392-93
requirements for degree ...	289-90	funds available	95-106
report of dean	283-93	to students	259-60
admission to the bar	283-85	Luehring, F. W., report of	371-76
alumni	288	Lyon, E. P., report of	294-97
conference on legal educa-		Mapes, Mrs. Emory	11
tion	284-85	Mayo, Dr. C. H.	11
entrance requirements	285-86	Mayo Foundation	11, 70, 297
faculty of	286-87	report of director	348-52
law library	286	collected papers	352
law schools and registration	285	distribution of applications	350
<i>Minnesota Law Review</i>	288-89	faculty	349
order of supreme court ...	285	fellowship personnel	351
physical equipment	286	financial statement	348
resolutions of American Bar		graduates	351-52
Association	283-84	students from other organi-	
scholarships	287-88	zations	349
school status	288	Mayo, Dr. W. J.	11
student body	287	McCreery, Otis C., report of ...	423-26
Leaves of absence. <i>See</i> Ab-		Mechanization of industry. <i>See</i>	
sence.		Industry.	
Lecturers		Medical School	
special	131	extension clinics	29
Legal Education, Conference on	284-85	report of dean.....	294-97
		advanced study	297

	Page		Page
Medical School (continued)		Mines and Metallurgy, School	
report of dean (continued)		of (continued)	
comprehensive examination		U. S. Bureau of Mines.....	313-15
system	294-95	blast furnace investigations	314-15
enrolment	294	manganese problems	314
informal consultation	296	Minneapolis Retail Druggists	
new hospital units	295	Associations. <i>See</i> Pharmacy,	
readjustments in Millard		College of	
Hall	295	<i>Minnesota Chats. See</i> News	
relations with medical pro-		Service.	
fession	295-96	Minnesota Cooperative Buyers'	
research	296-97	Association, Incorporated ...	401, 426
symposium	297	<i>Minnesota Daily</i>	
research problems, unsolved..	78	finances	396-97
summary of research	513-22	Minnesota General Hospital. <i>See</i>	
biometric and statistical		University Hospital and Dis-	
methods of growth	513-14	pensary.	
blood cells and diseases ...	514	Minnesota Hospital and Home	
effects of inanition on body	513	for Crippled Children.....	10
hypophysis and the nervous		Minnesota Investigation of Me-	
system	514	chanical Ability	467
summary in Department of		<i>Minnesota Law Review</i>	288-89, 397
Bacteriology	514-18	<i>Minnesota 1929 Laws</i>	111
summary in Department of		Minnesota Masquers	397
Pathology	518-19	<i>Minnesota Mentor</i>	330-31, 397
summary in Department of		Minnesota Pharmaceutcal Edu-	
Pharmacology	519-20	cational Conference. <i>See</i>	
summary in Department of		Pharmacy, College of.	
Physiology	520-22	<i>Minnesota Quarterly</i>	397
Mental hygiene	410-11	Minnesota State High School	
Middlebrook, W. T., report of..	241-61	Music Contest	358-60
Military Science and Tactics,		Minnesota State Pharmaceutical	
Department of		Association. <i>See</i> Pharmacy,	
report of	383	College of.	
efforts to increase interest..	383	Minnesota Tax Commission,	
enrolment	383	service of School of Mines to.	
National Organization of		<i>See</i> Mines and Metallurgy,	
Pershing Rifles	383	School of.	
officers club	383	<i>Minnesota Techno-Log</i>	114-15
Mines and Metallurgy, School of		Minnesota Union	
report of dean	312-18	report of president of board..	433-36
activities	313	board of governors.....	433
assays	313	club department	434
experiment station	312-13	financial statements	435-36
changes in personnel ...	312	operations and activities....	433-34
new equipment	312-13	functions accommodated..	433-34
publications	313	projects	434
service to Minnesota Tax		services in past	434-35
Commission	315-18	Money, Frances M., report of..	
beneficiated ore	316-18	Mother's Day	35, 132, 400
merchantability of ore ...	316	Municipal Reference Bureau...	26
report on 167 properties..	315-16	aid in research.....	526
student mortality	312	library service	362
summary of research in.....	512-13	projects	363
teaching staff	318	publications	360
		schools and conferences spon-	
		sored	361-62

	Page		Page
Municipal Reference Bureau (continued)		O'Brien, Dr. W. A.....	296, 300
services of	361	Orthopedic classes for women..	378
staff	362-63	Out-Patient Department. <i>See</i>	
Murphy, William J.	11, 70	University Hospital and Dis-	
Museum of Natural History		pensary.	
report of director.....	417-22	Owings, Chloe, report of.....	445-47
accessions	418-19	Parent education	441-42
attendance	417	Parents, co-ordination of Univer-	
exhibits	417-18	sity with. <i>See</i> University.	
field work	420-21	Pathology, Department of	
finances	421-22	summary of research.....	518-19
contribution fund	422	diseases of the kidney.....	518-19
donation fund	421-22	heart disease	519
help budget	421	Pedersen, Peder	19, 356
supply budget	421	Peik, W. E., study.....	338
publications	420	Pepinsky, Abe, report of.....	358-59
used to instruct children ...	417	Permanent University Fund..	67-68, 245
Music		Pharmacology, Department of	
Artists' Course	131	summary of research.....	519-20
Minnesota U., center for.....	44	aromatic alcohols	519
State High School Contest...	350-00	antiseptics	519-20
National Association of Boards of Pharmacy. <i>See</i> Pharmacy, College of.		Pharmacy, College of	
National Conference on Pharma- ceutical Research. <i>See</i> Phar- macy, College of.		report of dean.....	319-26
National Economic League.....	290	advancement of standards..	319-21
National Wholesale Druggists' Association. <i>See</i> Pharmacy, College of.		high standards of future..	320-21
Natural History, Museum of. <i>See</i> Museum of Natural His- tory.		legislative acts	319
Natural sciences		college relations with organ- ized pharmacy	322-26
laboratory work in, as aid to individual guidance	268	co-operation with other de- partments	326
News Service	29	equipment	325
<i>Minnesota Chats</i>	29-30	graduate work	321
Nicholson, Edward E., report of	395-402	research	324-25
Non-fraternity student rating...	399-400	scholarships	325-26
Norris, J. Anna, report of.....	377-82	special lectures	325
Northern Pacific tracks.....	9, 46	teacher training	321-22
Northrop Memorial Auditori- um. <i>See</i> Cyrus Northrop Me- morial Auditorium.		services to state.....	326-28
Northwest region		summary of research	522-25
advantages of	38-39	Physical Education and Ath- letics, Department of	
cultural center	39-41	report of director.....	371-76
development of	37	athletic receipts and attend- ance	374
Northwest Regional Survey. <i>See</i> Survey.		directorial change	376
Nursing, School of		high school meets.....	376
report of director.....	298	intercollegiate athletics ...	375
arrangement of courses.....	298	intramural athletics	373
preparation of students.....	298	objectives of course	371-72
		registration	372
		retarding factors	372-73
		Teachers' Training Course.	373-74
		Physical Education for Women, Department of	
		report of director.....	377-82
		academic credit for courses.	377
		enrolment	382
		health examinations	379-80

INDEX

551

	Page		Page
Physical Education for Women, Department of (continued)		Psychology, Department of (con- tinued)	
report of director (continued)		summary of research in (con- tinued)	
orthopedic division	378	Minnesota Investigation of Mechanical Ability	467
professional courses	380	tests to high school students	14-15, 266
recreational activities	380-81	Publications	
required physical education .	377-78	Education, College of	333
sophomore requirement	378-79	Mines and Metallurgy, College of	313
staff and building	380-82	Minnesota Municipalities	360
Women's Athletic Associa- tion	380-81	Municipal Reference Bureau . .	360
Physical examinations		Museum of Natural History . .	418-19
entrance	409	of faculties	539
periodic	116, 409	student, status of	397
special	409	Public Health Nursing	
Physics, Department of		report of director	298-99
summary of research in	471-73	attendance	298
Physiological Chemistry	521-22	curriculum changes	299
Physiology, Department of		needs for future	299
summary of research	520-22	Quarterly enrolment. <i>See</i> Reg- istration.	
section of Biophysics	522	Radio Station, WLB	
section of Physiological Chem- istry	521-22	radio programs	363-64
section of Physiology proper	520-21	radio report	364-66
Pierce, E. B., report of	427-28, 433-36	equipment	366-67
Pledging, rules for	112	programs	364-66
Political Science, Department of		publicity	366
summary of research in	490-94	University Press programs . . .	449
Predominant diseases among stu- dents	410	Receipts from athletics	245, 374
President, report of	5-180	Recommendations, Bureau of. <i>See</i> Bureau of Recommenda- tions.	
assistants to	27-28	Recreation, summer session . . .	369-70
Preventive Medicine and Public Health		Recreational activities, women's athletics	380-81
research problems	79	Regents, Board of. <i>See</i> Board of Regents.	
Private institutions. <i>See</i> Insti- tutions.		Registrar	
Prizes to students	95-106	report of	181-240
Professional course, women's athletics	380	research problems	79
Professional fraternities. <i>See</i> Fraternities.		Registration	
Professional sororities. <i>See</i> So- rorities.		Agriculture, College of	272-73
Program, educational. <i>See</i> Edu- cational program.		by quarters	183, 188
Promotions on staff	156-60	comparative figures	193
Psychological tests for high school seniors	266	Engineering and Architecture, College of	269
Psychology, Department of		General Extension	356-57
laboratory fee	117	Graduate School	347-48
summary of research in	467-68	increase of	9, 10, 48
Influence of Typographical Factors on Speed of Read- ing	468	Law, School of	285
Mechanism of the Brain in Relation to Learning and Intelligence	467	Library Instruction	384
		limiting of	42-43
		Medical School	294
		Military Science and Tactics . .	383

	Page		Page
Registration (continued)		Research (continued)	
Mines and Metallurgy, School		Pharmacy, College of	322-25, 328, 522-25
of	312	Political Science, Department	
Physical Education and Ath-		of	490-94
letics	372	problems for	76-79
Physical Education for Women	382	Science, Literature, and the	
statistics of	183-240	Arts, College of.....	462-73
student	250-51	Botany	463-65
by schools and colleges.....	186-88	English	462-63
subcollegiate	189-91	Geology	468-71
Summer Session	368	Physics	471-73
Religious Workers' Conference.	130	Psychology	467-68
Reorganization		Zoology	465-67
Law, School of	57, 289-93	selection of regents	88-92
Reports of administrative offi-		summary in collegiate educa-	
cers. <i>See</i> Administrative offi-		tional	527-37
cers, reports of.		summary in social sciences ..	473-503
Report of Committee of Seven.		ten years of scientific	451-526
<i>See</i> Committee.		Resignations in faculty	160-64
Report of the Committee on Pro-		Retirements in faculty	164
fessional Training of College		plan for	33, 75-76
Teachers	339-43	Richardson, Harlow C., report of	368-70
Report of comptroller. <i>See</i>		Roberts, Thos. F., report of ...	417-22
Comptroller, report of.		Rockefeller, Laura Spelman ...	10-11, 28
Report of dean of College of		<i>Rules and Regulations Governing</i>	
Science, Literature, and the		<i>the University. See</i> Univer-	
Arts. <i>See</i> Science, Literature,		sity.	
and the Arts, report of dean.		Salaries of faculty. <i>See</i> Fac-	
Report of registrar. <i>See</i> Regis-		sity.	
trar, report of.		Salas and miscellaneous—from	
Research		report of comptroller	252-58
agricultural economics	477-79	Sanford Hall	386
Agriculture, College of	454-62	Scholarships	
anthropological and archeologi-		awarded through office of dean	
cal	34	of women	393
Business Administration, School		gift	95-106
of	354, 479-85	Law, School of	287-88
Child Welfare Institute	437-39	offered by municipalities ...	73-74
co-operative	25-26, 59, 473-77	offered by private institutions	72-73
Dentistry, College of	525, 311	Pharmacy, College of	325-26
Engineering, College of.....	503-11	Thomas A. Edison	75
Geography, Department of....	502-3	to best students	71-75
History, Department of	485-90	Scholastic comparison	398-400
intercollegiate athletics	95	Schools from which entrants are	
interest in	24	accepted. <i>See</i> Students.	
justification of	454	Science, Literature, and the	
Medical School	513-22	Arts, College of	
Anatomy	513-14	laboratory fee in Psychology ..	117
Bacteriology	514-18	report of dean	265-68
Pathology	518-19	additional information on	
Pharmacology	519-20	student	266
Physiology	520-22	college rating	266
Mines and Metallurgy, School		courses for freshmen	267
of	512-13	curricula and individual	
		ability	265-66

INDEX

553

	Page		Page
Science, Literature, and the Arts,		Sororities (continued)	
College of (continued)		professional, scholastic rating	399
report of dean (continued)		scholastic comparison	398-400
Educational Guidance Com-		Speakers. <i>See</i> Lecturers.	
mittee	267	Speer, A. H.	358
efforts with entering class	268	Stadium, erection of	10, 111
<i>How To Study</i>	266, 267	Staff. <i>See</i> Faculty.	
students of unusual ability	267-68	State	
transfer students	265	endowment of University by	68-70
trends in enrolment	265	expansion of endowment	64-70
research	79, 462-73	Pharmacy, College of, services	
Scientific research, activity in.		to	326-28
<i>See</i> Research.		services of	28-30
Sears, Dr. J. B.	30	support	244
Selection of students. <i>See</i> Stu-		University as agent of	66-67
dents.		State Tax Commission, service	
Senate. <i>See</i> University Senate.		of School of Mines to. <i>See</i>	
Senior Adviser Bureau		Mines and Metallurgy, School	
future of	402	of.	
number of students aided	401	Stevenson, Russell A., report of	353-54
services to students	401-2	Steward, T. E.	29
Shevlin Hall	392	Student organization finances.	
cafeteria	392	<i>See</i> Finances.	
Short courses		Students	
Agriculture, College of	251, 281-82	accepted from secondary	
<i>Ski-U-Mah</i>		schools 1928-29	196-205
desirability of	397	1929-30	206-16
finances of	396-97	admitted with advanced stand-	
Social Hygiene Bureau		ing 1928-29	217-23
report of director	445-47	1929-30	185, 224-30
available facilities	447	collegiate enrolment	183, 186-88, 250
present status of program	446	counsel for	16
program	445	freshmen	267-68
results of study in methods	447	degrees conferred on	194-95
survey of courses at Minne-		entering students	14-15
sota	446-47	excuses for absences of women	
Social order, improvement of	82	students	385-86
Social Service Department of		fees, by colleges	248-49
University Hospital	304-9	foreign. <i>See</i> Foreign students.	
case work	304	geographical distribution of	
interpretive service	306-7	1928-20	231-35
Faculty Women's Club	307	1929-30	184, 236-40
introduction new record system	304	guidance of	333
methods of work	308	individual treatment of	57, 268
period of reorganization	304	loans to	259-60
plans	308-9	non-fraternity, rating	399-400
special studies and research	307-8	personnel of, in Agriculture	278
teaching	307	prospective	265-68
Society for the Promotion of		relations with teachers	11-12
Engineering Education	18	residence of women students	385
Sociology, Department of, sum-		scholarships for	71-75
mary of research	494-502	selection of	20-21
Sorenson, Herbert	19, 356	subcollegiate	183, 189-90, 250
Sororities		transfer	265
deferred rushing, "C" aver-		trends in enrolment	265
age	391-92	working and living conditions	16-17
Panhellenic rules	391-92	Students' Work Committee	267-68

	Page		Page
Subcollegiate students. <i>See</i> Students.		University Field House. <i>See</i> Field House.	
Summer Session		University Health Service	
advertising of	74	report of director	403-12
agricultural education in	115	dental department	411
attendance	368	general statement	403-4
chemical symposium	271	health instruction	404
convocations	369	health service building	411-12
medical symposium	297	health service clinics	405
recreation	369-70	mental hygiene	410-11
report of associate director ..	368-70	number of visits to	405
special projects	368-69	physical examinations	116, 409
special symposia	26	predominant diseases	410
Support of University. <i>See</i> University.		professional staff	404
Supreme Court		purpose of	403-4
ruling on admission to bar ..	285	report of Dr. de Berry ..	410-11
ruling on Regents' suit	117-19	student infirmaries or hospitals	408
Survey		student patients	408
Engelhardt	338-39	on main campus	409
geological	28, 415-16	total services rendered	406-7
Land-Grant College	18-19	University High School	
Mines and Metallurgy	28	reorganization	329, 334
Northwest Regional	26	University Hospital and dispensary	
Symposia, special	26	report of superintendent	299-309
Teachers. <i>See</i> Faculty.		dispensary report	302-3
Teachers Training Course in		In-Patient Department	301
Athletics	373-74	Minnesota General Hospital ..	303-4
Teacher-student relationship ..	11-12	Out-Patient Department	300
Teaching		growth	300
duplication of	60	summary	301-2
enthusiasm for	22-23	social service report	304-9
improvement of	17-25	superintendent of	296
need for experts	62	Todd Memorial	11
training in athletics	373-74	University of Minnesota	
training in pharmacy	321-22	advantages of	42
<i>Techno-Log.</i> <i>See</i> Minnesota <i>Techno-Log.</i>		and private institutions	40, 61
Teeter, Thomas A. H., report of	355-67	Artists' Course at	131
Ten-year building program	9, 45	co-operation of staff	17-18
Todd, Mrs. Frank C.	11	co-ordination with parents and alumni	31-35
Todd Memorial. <i>See</i> University Hospital.		development and reorganization	57-60
Transfer students. <i>See</i> Students.		difficulty of securing funds for	66
Tuition. <i>See</i> Fees.		duplication of work	60-62
Tutoring Bureau. <i>See</i> Senior Adviser Bureau.		external relations of	87-108
Tuttle School, elementary demonstration school	336-37	future of, in Northwest	36-39
Union. <i>See</i> Minnesota Union.		government of	117-23
United States Bureau of Mines	313-15	growth of	9-10, 41-43, 45-52
University code. <i>See</i> University.		in co-operation with other colleges	62-64
		Library. <i>See</i> Library.	
		life at	125-39
		meaning and significance	30

INDEX

555

	Page		Page
University of Minnesota (con- tinued)		U. S. Pharmacopœial Conven- tion. <i>See</i> Pharmacy, College of.	
natural center of music and art	44	Vannier, Marion L., report of .	298
regulation of funds	67-68	Vocational Counsel for Women	
<i>Rules and Regulations</i>	67-68	report of counselor	393-94
scientific and intellectual		employment aid	394
leader	40-41	increase in interviews	393
scientific research at	451-526	vocational committee	394
solicitation of students	74		
state service to	28-30	Walter, Frank K., report of 384, 413-14	
student-teacher relationship ..	12	West, Rodney M., report of .. 181-240	
support of	35	<i>Who Should Go to College</i>	266
University of Minnesota Com- mittee on Educational Re- search	527-37	<i>Who's Who</i> , faculty listed	36
completed studies		Wilson, Louis B., report of ...	348-52
Class Size at the University		WLB. <i>See</i> Radio station.	
Level	530-31	Women's Athletic Association ..	380-81
Curricular Problems in Sci- ence at the College Level	532	aim of	390
Experimental Study of the Reading Abilities of Col- lege Students	534	Penny Carnival	391
Laboratory Instruction in the Field of Inorganic Chemistry	532-33	Play Day	391
Medical School Investiga- tion	533-34	Women's Co-operative Alliance	11, 445
Problems of Science Teach- ing at the College Level .	531	Women's Self-Government As- sociation	387-89
development of methods ..	529-30	Big Sister work	387
growth	528-29	other activities	389
incomplete studies	534-37	round table discussions	388-89
inadequacy of usual pro- cedure	528	second hand book store	387
personnel of	527-28	sponsoring of dances	387
University Press	34	Woodruff, Katherine, report of .	393-94
report of editor	448-50	Wulling, Frederick J., report of	319-26
increase in activity	448		
increase in staff	448	Young Men's Christian Associa- tion	
new titles issued	333, 449-50	4-H Club	
promotion program	449	ability of members	274
sales increase	448-49	development of program ...	278
University radio programs and report	363-67	increase in members	276, 280-81
University Senate	92-93	Young Women's Christian As- sociation	389-90
Upson, Arthur	33	church pilgrimage, purpose of	390
		freshman discussion groups ..	389
		summer conference	390
		vesper services	390
		Zoology, Department of	
		summary of research in	465-67