

The University of Minnesota

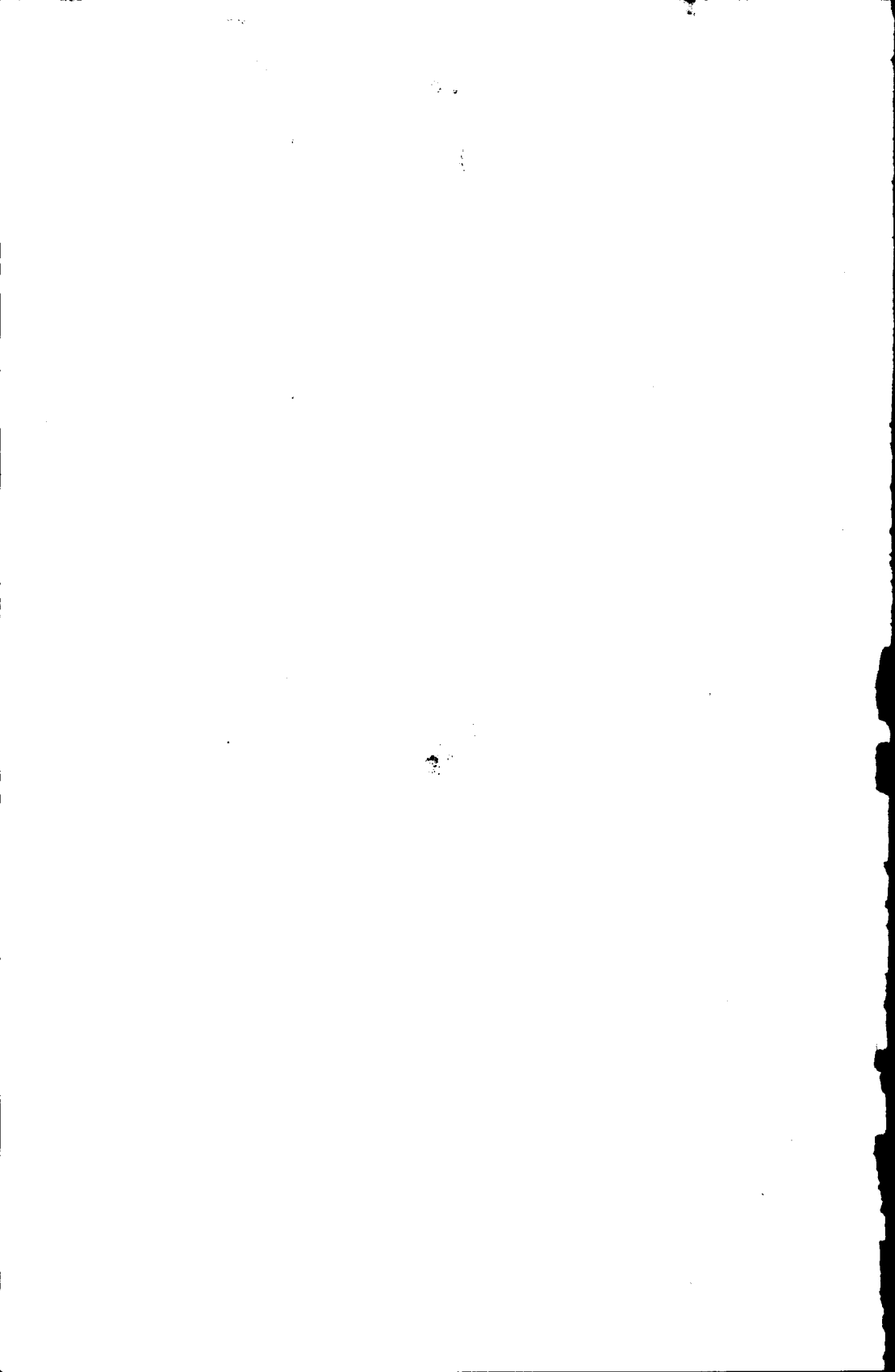
THE PRESIDENT'S REPORT

1911-1912



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THE PRESIDENT'S REPORT

To the Board of Regents of the University of Minnesota:

GENTLEMEN: I herewith submit my report for the year ending July 31, 1912.

In a large university changes in the personnel of the teaching staff take place constantly. Mention of changes during the year is limited to men and women of professorial rank.

Resignations.—Professor Ada Comstock, Dean of Women, resigned to accept the Deanship of Smith College. Professor Robert S. Kolliner withdrew from the Law School on account of ill health. Professor Willis M. West, head of the Department of History, retired to give his time to writing. Assistant Professor John Lee Coulter, on leave of absence from the Department of Economics and Political Science, withdrew to continue in the service of the Bureau of Labor in Washington. Assistant Professor William H. Tomhave accepted the headship of the Department of Animal Husbandry in Pennsylvania State College. Assistant Professor George Porter Paine withdrew from the Department of Mathematics to fill a professorship in Middlebury College, Vermont. Assistant Professor Robert B. Gibson resigned from the Department of Physiologic Chemistry.

Retirements.—The following members of the Faculty have been retired and are in receipt of allowances from the Carnegie Foundation for the Advancement of Teaching: Professor Henry Turner Eddy as Dean of the Graduate School and Professor of Mathematics and Mechanics, Emeritus; Professor Adam C. Hickman as Professor of Law in the Law School; Professor Arthur E. Haynes as Professor of Mathematics in the College of Engineering.

Leaves of absence.—Professor John H. Gray, Head of the Department of Economics and Political Science, was granted leave of absence without salary for the second semester to conduct an investigation under the auspices of the National Civic Federation. Professor Edward G. Quigley, of the College of

Education, was granted leave of absence without salary for the year. Assistant Professor Josephine E. Tilden, of the Department of Botany, was assigned duty on half salary in connection with an expedition to Tahiti and New Zealand. The expenses for the trip were provided by friends of the University interested in botanical research. Professor Carl Schlenker, of the Department of German, was granted sabbatical leave for one year with half salary.

Appointments.—The following appointments to positions of professorial rank were made during the year:

William R. Vance, Professor of Law and Dean of the Law School.

B.A., 1892, M.A., 1893, Ph.D., 1895, LL.B., 1897, Washington and Lee University; M.A.-Hon., 1909, Yale; Instructor in English, 1892-5, Assistant Professor of Law, 1897-9, Professor of Law, 1899-1902, Dean of Law School, 1902-3, Washington and Lee University; Professor of Law, 1903-5, Dean of Law School, 1905-10, George Washington University; Lines Professor of Law, Yale, 1910-12; Professor of Law, 1909, 1911 (summer quarters), University of Chicago.

William H. Emmons, Head of the Department of Geology and Director of the State Geological Survey.

B.A., Central College, 1897; Ph.D., University of Chicago, 1904; Fellow in Geology, 1901-2, Research Assistant in Geology, 1903-4, University of Chicago; Aide, U. S. Geological Survey, 1904-6, Assistant Geologist, U. S. Geological Survey, 1906-10, Geologist, U. S. Geological Survey, 1910-; Lecturer on Ore Deposits, 1907, Lecturer on Petrology, 1908, Associate Professor of Economic Geology, 1908-11, University of Chicago.

Edward S. Thurston, Professor of Law in the Law School.

B.A., 1898, M.A., 1900, LL.B., 1901, Harvard; Instructor of Law, 1906, Indiana University; Assistant Professor of Law, 1906-7, Professor of Law, 1907-10, George Washington University; Professor of Law, University of Illinois, 1910-11.

Howard R. Smith, Professor of Animal Husbandry in the Department of Agriculture.

B.S., Michigan Agricultural College, 1895; Instructor in Science, Tilford Collegiate Academy, 1895-7; Instructor in Chemistry and Physics, Rock Island, Ill., High School, 1897-9; Acting Professor of Agriculture, University of Missouri, 1900-1; Assistant Professor of Animal Husbandry, 1901-2, Associate Professor, 1902-3, Professor of Animal Husbandry, 1903-12, University of Nebraska.

Margaret Sweeney, Professor in the Department of Rhetoric and Dean of Women.

B.A., Radcliffe College, 1899; Ph.D., Yale, 1901; Principal, Radcliffe Hall, Belmont, Cal., 1895-8; Instructor in English, Wellesley College, 1901-2; Vice-Principal of the Berkeley Institute, Brooklyn, N. Y., 1902-7; Dean of Women and Assistant Professor of English, Adelphi College, Brooklyn, N. Y., 1907-12.

Ashley V. Storm, Chief of the Division of Agricultural Education
with the rank of Professor.

Ph.B., Illinois Wesleyan, 1898; M.A., Iowa State University, 1912; Superintendent of Schools, Winchester, Ill., 1891-4; Superintendent of Schools, Storm Lake, Iowa, 1894-8; Superintendent of Schools, Cherokee, Ia., 1898-1906; Superintendent of Schools, Iowa City, Ia., 1906-7; Director National Educational Association for Iowa, 1903-7; Extension Professor Public School Agriculture, Iowa State College of Agriculture and Mechanic Arts, Ames, Ia., 1907-11; Professor of Agricultural Education and Head of Department, Iowa State College, Ames, Ia., 1911-12; Director and Dean of Summer Session, Iowa State College, Ames, Ia., 1911-12.

Edwin H. Hewitt, Professorial Lecturer in Architecture and
Consulting Architect to the Board of Regents.

B.A., University of Minnesota, 1896; Postgraduate work, Boston Institute of Technology, 1897; Practice in Boston, 1897-1900; National School of Fine Arts, Paris, postgraduate work, 1900-4; Practice in Minneapolis, since 1904.

Lieutenant James B. Woolnough, Professor of Military Science.

Graduated from the United States Military Academy, 1904; Assigned as 2d Lieutenant to the 21st U. S. Infantry at Fort Snelling, Minnesota; Served in Samar, P. I., 1905-6; Served at Fort Logan, Colorado, 1907-8; Battalion Quartermaster and Commissary, 3d Battalion 21st U. S. Infantry, March 5, 1909-March 5, 1911; Served in Mindanao, P. I., 1909-11; Promoted 1st Lieutenant 21st U. S. Infantry, March 11, 1911.

J. O. Rankin, Editor of Agricultural Publications with the rank
of Professor.

B.A., Tarkio College, 1904; B.S.A., Iowa State College, 1908; M.A., George Washington University, 1912; Instructor in Mathematics and Science, Osceola High School, 1905; Professor of Mathematics and Physics, University of Tennessee, 1905; Instructional Work in English, Iowa State College, 1908; Professor of Agriculture and Science, Talladega College, 1909; Field Crops Editor of the Experiment Station Record, U. S. Department of Agriculture, 1909-12; Special Agent, Bureau of Census, 1911; Assistant Professor of Economics, Iowa State College, 1912.

J. Anna Norris, Director of Health for Women with the rank of
Assistant Professor.

Graduate, Boston Normal School of Gymnastics, 1895; Instructor in Physical Training, Cortland, N. Y. State Normal School, 1895-7; M.D., Northwestern University, 1900; Supervisor of Physical Training, Public Schools, Springfield, Mass., 1902-7; Instructor in Hygiene and Physical Education and Assistant School Physician, School of Education, University of Chicago, 1907-12.

O. M. Olson, Assistant Professor in charge of Demonstration
Farms.

Graduate Minnesota School of Agriculture, 1903; Assistant Superintendent Farmers' Institutes, State of Washington, 1908-9; Agricultural Extension Work, University of Minnesota, 1910.

Thomas G. Paterson, Assistant Professor of Animal Husbandry.

B.S.A., Minnesota, 1909; Assistant in Animal Husbandry, Kansas State Agricultural College, 1909-12.

Louis D. H. Weld, Assistant Professor, Extension Work in Economics and Political Science.

B.A., Bowdoin, 1905; M.A., University of Illinois, 1907; Ph.D., Columbia University, 1908; Instructor, University of Washington, 1908-9; Instructor, University of Pennsylvania, 1909-10; Lecturer, New York University, School of Commerce, Accounts, and Finance, 1911-12.

Promotions.—The following promotions to positions of professorial rank were made during the year:

College of Science, Literature, and the Arts.

Alois F. Kovarik from Instructor to Assistant Professor of Physics.
Herbert Woodrow from Instructor to Assistant Professor of Philosophy and Psychology.

College of Agriculture.

John P. Wentling from Assistant Professor to Associate Professor of Forestry.
Margaret J. Blair from Instructor to Assistant Professor of Domestic Art.
Juanita L. Shepperd from Instructor to Assistant Professor of Domestic Science.
Alfred R. Kohler from Instructor to Assistant Professor of Horticulture.
Jason L. Mowry from Instructor to Assistant Professor of Agricultural Engineering.
Harry B. Roe from Instructor to Assistant Professor of Mathematics.
William H. Frazier from Instructor to Assistant Professor of Soils.
Wieland L. Oswald from Instructor to Assistant Professor of Agricultural Botany.
Rodney M. West from Instructor to Assistant Professor of Agricultural Chemistry.
Alvah M. Bull from Instructor to Engineer in Charge of Buildings with rank of Assistant Professor.
Albert C. Army from Instructor to Assistant Professor of Agronomy.

College of Medicine and Surgery.

Winford P. Larson from Demonstrator in Bacteriology and Pathology to Assistant Professor of Bacteriology and Pathology.
Harry P. Ritchie from Clinical Instructor to Assistant Professor in Surgery.
Fred L. Adair from Instructor to Assistant Professor of Obstetrics and Gynecology.
Henry L. Williams from Instructor to Assistant Professor of Gynecology.
Arthur S. Hamilton from Clinical Instructor to Assistant Professor in Nervous and Mental Diseases.
Eugene S. Strout from Clinical Instructor to Assistant Professor in Ophthalmology and Otology.
William A. Hilton from Instructor to Assistant Professor of Histology and Embryology.
Frederick H. Scott from Assistant Professor to Associate Professor of Physiology.

College of Dentistry.

Henry S. Godfrey from Clinical Professor to Associate Professor.
Jay N. Pike from Clinical Professor to Associate Professor.
Amos S. Wells from Clinical Professor to Associate Professor.
William F. Lasby from Clinical Professor to Associate Professor.
Norman J. Cox from Instructor to Assistant Professor.
Herman A. Maves from Instructor to Assistant Professor.
Robert O. Green from Instructor to Assistant Professor.
George M. Damon from Instructor to Assistant Professor.
Charles A. Griffith from Instructor to Assistant Professor.
Harry C. Lawton from Instructor to Assistant Professor.
Alfred A. Pagenkopf from Instructor to Assistant Professor.

ADMINISTRATIVE CHANGES

The Deans' Committee.—The Deans of the colleges and schools have, with the President, formed a central administrative committee that has attempted to see the interests of the University as a whole at the same time that it has consulted the welfare of each of the constituent units. The spirit of mutual consideration and loyalty displayed by this group has been gratifying and full of promise for the future. The Deans recommended to the Regents the budget upon which, after many conferences, an agreement had been worked out. When in preparing the budget for 1911-12, it was discovered that expenditures would have to be cut down by nearly \$30,000 in order to be safely within the income available, the Deans showed a remarkable willingness to make sacrifices in order that a safe budget might be prepared. This committee of the Deans, together with the new University Senate, provides a centralized organization which ought to increase the unity of the institution as a whole without impairing the desirable rivalries between its various parts.

The University Senate.—On May 6, 1912, the Regents adopted on the recommendation of the University Council a constitution for the University Senate. The constitution recognizes the autonomy of the various colleges and schools of the University, and at the same time establishes a central body to which are entrusted the interests and welfare of the University as a whole. The Senate is not made up of representatives of the various colleges, but includes all teachers of the rank of Professor and Associate Professor throughout the institution. It is to be hoped that the University Senate will do much to increase the growing feeling of University unity, will recognize the organic interde-

pendence of all the parts of the institution, and will foster the mutual respect and comradeship which should characterize an academic community.

Recommendations of promotions.—On the recommendation of the Deans the Regents have rescinded the regulation by which faculties recommend their members for academic promotion. This action was taken from the conviction that the gains in democracy were more than offset by the tendency toward political activity within the various faculties. It is the essence of good administration for officers to confer carefully with members of departments concerned, and with members of other departments before recommendations for promotion are presented to the Board of Regents.

The Associate Professorship.—The Regents have re-established the academic rank of Associate Professor. This type of professorship is administratively useful. It affords an opportunity to test men who have established their right to be promoted from an assistant professorship, but whose qualifications for a professorship are still in doubt. It provides a permanent position of dignity for men whose value to the University is unquestioned, but whose fitness for the highest academic rank is not convincingly demonstrated. An Associate Professor is by virtue of his position a member of the University Senate.

Appointments for definite periods.—The Regents have revived the policy of appointing instructors for periods of one, two, or three years. Appointments to Assistant Professorships are ordinarily made for a period of four years and to Associate Professorships for a term of five years. Professorships remain as indeterminate appointments. The policy of making periodic appointments for the lower academic ranks is obviously in the interests of good administration and for the protection of members of the staff. An Instructor has the right to know at fixed intervals whether his service is satisfactory. The Assistant Professor in the same way ought to have the question of his promotion or the increase of his salary come up for decision at a definite time.

Salary payments.—Since August 1, 1911, salary payments have been made in twelve installments instead of ten. By this arrangement instructors' incomes are evenly distributed throughout the year, and the fact is emphasized that the vacation period,

devoted to pursuits which have a bearing upon a man's scholarly growth and productivity, or to needed recuperation, is a part of the service which he owes to the institution. This arrangement does not affect the practice of giving additional sums to men who teach in the summer schools or engage in work for the Botanical or for the Geological Survey.

University Extension Board.—In furtherance of the policy of developing the extension work of the University, the Regents have authorized the appointment of a University Extension Board, and have created the position of Director of University Extension. The Board at present includes the President of the University, the Director of University Extension, and representatives from all the colleges under the auspices of which University Extension Work is being offered. With the organization of the Senate this Board will become one of the standing committees of that body.

Change of title in the Law Department.—The Regents have voted to change the title "The College of Law" to the title "The Law School of the University of Minnesota." This conforms with the nomenclature established by the leading law schools of the country and recommended by the American Association of Law Schools. This change is a symbol of the policy of the University to bring the Law School into conformity with the best standards of law teaching in the United States.

The status of the Dean of Women.—The position of Dean of Women in the University of Minnesota has been the subject of gradual development. With the appointment of a new Dean of Women a further step has been taken in defining the status of this deanship. The Regents have recognized this position as a university rather than a college office. The Dean of Women is not only a member of the committees on student work in the colleges which enroll women, but she is the administrative officer through whom all women communicate with these committees concerning college work.

Committees of the Board of Regents.—During the year these committees have been reduced in number and the membership re-arranged. In place of a number of special committees, which have been abolished, individual members of the Board have been designated as consulting members. With reference to certain

special interests the President of the University confers with these consulting members.

Codification of the rules of the Board.—Under the authority of the Regents, a card catalogue of the actions of the Board has been made, and will be used as a basis for a codification of the rules of the Board of Regents. This will be put in printed form and used as a guide for action. It will be formally amended as the rules of the Board are modified.

Printing Committee.—Progress has been made in creating uniform standards of printing for the various official publications of the University. A University printing committee has studied questions of typography, paper, etc. and has established forms which are now being followed in all the publications of the institution.

Weekly Calendar, Postal Delivery, Bulletin Boards.—In an effort to draw the University into closer unity a number of devices have been employed. A weekly University Calendar, containing announcements of University and college exercises, public lectures, committee meetings, student gatherings, etc., is issued from the President's office and posted on bulletin boards throughout the grounds and buildings of the institution. In connection with the University Post-Office, regular deliveries of mail to and from the different buildings have been established. An information bureau has also been opened in the Post-Office. An attempt is being made to standardize and improve the form of bulletins and notices which are posted upon the University bulletin boards. These have been increased in number and have been placed at all frequented points on the campus.

EDUCATIONAL POLICIES

Reorganization of the Law School.—The Regents have approved the plans for reorganization submitted by the Faculty of the Law School. These plans include the increasing of the number of hours required of candidates for the degree of Bachelor of Laws from 1,000 to 1,200, the introduction of the case-book system of instruction, originally worked out by the Harvard Law School, the reorganization of the courses on a semester basis with semester examinations, and the withdrawal of the degree for night law work. Night instruction in law is continued

in connection with the Division of University Extension. A more detailed description of the changes in the Law School will be found in the report of the Dean, pages 112 to 116.

Combined Course in Arts and Law.—By an arrangement between the Law School and the College of Science, Literature, and the Arts, a combined six years' course leading to the degrees of B.A. and LL.B. has been organized and has received the sanction of the Board of Regents. By this arrangement academic seniors may count the first year in the Law School as the fourth year of candidacy for the Bachelor of Arts degree.

Seven-Year Medical Course.—As a result of a conference with regard to the seven-year medical course, which is a combination of two years of preparation in the College of Science, Literature, and the Arts and five years of medical work, certain minor changes in the curriculum have been made. A regulation has also been adopted which requires a student who is a candidate for the degree of Doctor of Medicine to receive his B.A. or B.S. degree before the higher degree is conferred.

Entrance requirements.—Four years ago at the request of a committee of the high school men of the State, the University agreed to impose a qualitative as well as a quantitative requirement for admission to the University. As a consequence all but two of the colleges required that the various subjects presented on certificate by students seeking admission be appraised with three marks: "passed," "passed with credit," or "passed with honor." The value of these designations in percentages is also indicated. Each mark below "passed with credit" was counted as a condition, and an applicant having more than three conditions was excluded. Last year the rule was so modified as to exclude from the University a student who has not an average of "pass with credit." A "pass with honor" is regarded as offsetting a mere "pass." With the September registration, 1912, this new requirement becomes operative in the College of Science, Literature, and the Arts and in the College of Agriculture. Matriculants will have the option of entering under the former regulations which, however, will not afford much relief. What effect it will have can not be predicted with certainty, but the immediate result will in all probability be either a decrease in the number admitted or a check in the average increase

of recent years. Many problems will arise. The high schools of Minnesota are put upon an accredited list by the High School Board. The accrediting is almost wholly based upon conformity with the law. There is practically no attempt to discriminate as to the teaching efficiency of different schools. To what extent the demand for higher marks for admission to the University will bring upon the high school authorities a pressure which they will find it hard to resist can not be foretold, but the possibility must be kept in mind. The discrimination against high schools and preparatory schools in other states where different standards may prevail or different methods of accrediting be employed, raises another perplexing question. It must be remembered that this experiment was not initiated by the University, but by the high school principals who asserted that there are many students whom they desire to graduate from high school but whom they can not recommend for admission to college or university.*

During the year the University in conference with the representatives of the High Schools has extended the number of admission units accorded to vocational subjects to three units in the College of Engineering and Mechanic Arts where before only two units were recognized. Not more than one unit each of free-hand drawing, mechanical drawing, and shop work, not more than two units in agriculture, and not less than two units in stenography and typewriting, may be offered. This change in Engineering brings about approximate uniformity in the three large undergraduate colleges, namely, Science, Literature, and the Arts, Engineering, and Agriculture. In the colleges of Science, Literature, and the Arts and Agriculture, four vocational units are accepted.

*The new regulation went into effect in September. The registration in the College of Science, Literature, and the Arts was perceptibly lower. Many protests from high school principals were received. A list of questions was sent out to 256 high school principals. They were asked to give their judgment concerning the new arrangement. One hundred and twenty-nine replies were received. Eighty-nine voted in favor of the new regulations as a whole, two replied indefinitely, and nine failed to answer the question. Twenty-nine voted against the regulations; fifteen replied indefinitely. In reply to the question how many students had been rejected by the University because of the new regulations, the principals report an aggregate of sixty, together with another group of forty-one who were deterred from making any application whatever. In reply to other questions ten principals reported knowledge of cases in which students' grades had been changed by the authorities in order that the certificates might comply with the University regulations. One hundred and seven had no knowledge of such changes of records. Thirty-two feared that this practice would become prevalent. Seventy-seven thought there was no such danger. It is too early to reach final conclusions, but enough questions have been raised to make it clear that the operation of the regulations deserves careful scrutiny and thoughtful consideration.

Requirements for graduation.—The regulations of the College of Science, Literature, and the Arts require candidates for the Bachelor's degree to secure an average of "good" in half of their work. The object of this rule is to prevent the winning of a degree by the mere passing of so many hours of work. There is some ground for questioning whether this regulation is in practice accomplishing the desirable end which has been set up. The report of the Dean of the College (page 63) shows that for the first semester instructors distributed on the average to the following percentages of their students the grades indicated: to 21 per cent "excellent"; to 38.7 per cent "good"; to 24.5 per cent "pass"; to 5.5 per cent "conditioned"; to 5.2 per cent "failed"; ("incompletes" are not included). For the year the total number of grades was 19,918, distributed as follows: "excellent," 4,228 (21 per cent); "good," 7,863 (39 per cent); "pass," 5,534 (25 per cent); "conditioned," 1,228 (6 per cent); "failed," 1,065 (5 per cent). Reports based upon the actual grades reported by several colleges and universities* seem to indicate a norm somewhat as follows: A, 0 to 6 per cent; B, 15 to 21 per cent; C, 45 to 55 per cent; D, 20 to 28 per cent; E, 0 to 10 per cent. This system of letters does not exactly coincide with the designations in use in the College of Science, Literature, and the Arts. It is probable that part of "C" in the letter system would be included in "good" and a part of "D" would be counted as "passed." Whatever the mark may be which indicates bare compliance with the minimum requirements, the number who receive this mark should on the average represent at least half of the students. The variations above and below this medial zone should be further differentiated into two upper groups and two lower groups. The wide variation of the Minnesota grades from this norm raises this question: Have the instructors in the College of Science, Literature, and the Arts come to regard "good" as actually the medium grade? There is reason to believe that students, especially in the last two years, exert appreciable pressure upon their instructors by frequently calling attention to the necessity of securing an average of "good" in half the subjects. A little further light is thrown upon the problem by the report of the Registrar concerning the number who under this regulation have been denied

*Foster, *The Administration of the College Curriculum*, Chapter XIII.

their degrees. In 1908, nine students failed to receive their degrees. The rule affected the work of the senior year only. Six were graduated later. In 1909 six were excluded, of whom two were graduated later. In 1910 the same number failed to receive their degrees, which, however, were conferred after further work. In 1911 only three were excluded, but these received their degrees after the Summer Session. In 1912 the same number were denied degrees, although two received them on August 1st. Too much stress should not be laid upon these numbers, for undoubtedly the rule led a few at least to leave college because they saw the hopelessness of going on. Enough evidence is available to raise the question as to whether this qualitative requirement is proving successful. There is reason to believe that the marking system ought to be more thoroughly discussed and a much more uniform practice be introduced not only in the Academic college, but throughout the University as a whole. This is one of the problems which the University Senate will be asked to consider.

A Committee on Research.—The fund of \$10,000 which was granted by the last Legislature for research and publication has been apportioned by the Board of Regents on the recommendation of a research committee of the Graduate Faculty. This committee has received all applications for research subsidy, has interviewed the applicants, and has recommended a research budget. It is believed that in this way the fund has been carefully apportioned and has been used with wisdom and efficiency. The report of the Dean of the Graduate School enumerates the special purposes and the appropriations.

A Research Bureau in Agricultural Economics.—By action of the Regents in November, 1911, a Bureau of Research in Agricultural Economics was established in the Department of Agriculture. Until recently efforts have been chiefly expended upon helping the farmer to increase the productivity of his land. The time has come to aid him in the marketing of his produce. The Bureau will undertake special studies and issue reports concerning the marketing of different commodities. It will investigate various kinds of organizations of producers. It will give attention to the vital question of agricultural credit. It will report upon systems of land titles, methods of transfer, etc. It will make special detailed surveys of rural communities.

The results of studies and investigations will be published in practical bulletins of information.

A Department of Agricultural Education.—Minnesota is an acknowledged leader in the fostering of agricultural education. The device of direct subsidy from the State treasury has a remarkably stimulating effect upon local school ambition and activity. The widespread introduction of vocational education has suddenly created a demand for teachers of manual training, domestic science, and agriculture. The chief danger which now confronts this educational advance is a temporary reaction due to the lack of well-trained instructors who have a liberal conception of their work, both in its scientific and its social aspects, and who have had sufficient practical experience to give them influence in the community. The University recognizes its duty to provide a training for the teachers of vocational subjects. This training must be at once broad in its basis and technically efficient in its specialization. The Regents have therefore established a Department of Agricultural Education in the Department of Agriculture, but in close co-operation with the College of Education. For the head of this department one of the recognized leaders of agricultural education has been secured. Under his guidance a four years' college course designed to train teachers of agriculture and allied subjects will be organized and a competent staff appointed. It is believed that by this step the University is fulfilling a duty and insuring to the State a permanent leadership in the newer type of education.

The Summer Session.—The courses offered under University auspices for the six weeks following Commencement fall into two groups: those for students of college grade, and those for a sub-collegiate constituency, chiefly grade teachers. The latter courses are conducted under the auspices of the Department of Agriculture at St. Anthony Park. The possibilities of this type of school are being recognized and progress is being made. The collegiate courses, however, are almost wholly of an introductory character. They deal with elementary subjects. No graduate work and few advanced courses are available. Under these conditions a large registration is not to be expected. The policy of organizing the summer work on a larger scale should be immediately considered. A number of the professional schools have raised the question of offering summer instruction.

It is uneconomical to have a great university plant lying practically idle for three months. It is to be hoped that in the near future the university year may be readjusted in such a way as to provide continuous instruction. An immediate subsidy of several thousand dollars would be required to put the summer school upon a creditable plane. To attempt to make it self-sustaining requires that the fees be excessive and that only introductory work be offered. The University can not afford to maintain a summer coaching school and must establish a summer session.

University Extension.—Heretofore extension work by the University has been limited to Agricultural Extension, to night courses in Economics and Political Science, to correspondence work, and traveling supervision in education, and to a limited number of popular lectures delivered by members of the University staff. In June, 1912, eighteen towns were reached by a series of "University Weeks" (see page 163). The time has come for the organization of all the extension activities of the University into a regular Department of University Extension. This policy has been approved by the Regents and an administrative organization provided. (See page 9.) In order that the University may render to the entire State the service which the people have the right to demand, the extension staff must be largely increased, the various forms of extension activities multiplied, the State divided into extension districts, the co-operation of all existing agencies secured, and a unified plan of reaching all the people systematically and effectively with educational influences must be worked out.

New Experiment Farms.—Under the authority granted by the last Legislature, experiment farms have been purchased at Duluth and at Waseca. It is the purpose of the administration to work out upon these farms problems of peculiar interest to the regions in which the farms are located. It is planned, moreover, to give each of these farms an individual character by concentrating upon some special undertaking. For example, it is planned to breed at the Waseca Farm certain types of horses and cattle. It is hoped that these farms will not only prove important centers of scientific experiment, but that they will also be available for practical demonstrations and will be visited by large numbers of farmers in the regions which are served.

THE TEACHING STAFF

Classification of the teaching staff.—The total number of the Faculty has little significance until it has been analyzed. Table I shows the number of each of the academic grades who are giving full time or part time to the service of the University. Of the service of the deans and administrative officers, approximately half time is given to instruction. In the professional schools, notably Medicine and Surgery, and Dentistry, many men are giving a varying amount of time to teaching. A large number serve without pay and give little actual time to students. The clinical members of the staff have been assigned a separate column in this table because they represent a peculiar status which it is well to differentiate. The table includes professors and instructors who give part time to research in the Agricultural Experiment Station, part time to the College of Agriculture, and part time to the School of Agriculture. Certain teachers in the University High School in the College of Education are also included. Because so many colleges are engaged in teaching students from other divisions of the University, it is difficult to estimate the number of the teaching staff of any one school or college in the institution.

TABLE I. THE MEMBERS OF THE TEACHING STAFF CLASSIFIED ACCORDING TO RANK, FULL TIME, ETC.

RANK	RETIRED	FULL TIME	PART TIME	CLINICAL	TOTALS
Deans and Admin. Officers...	1	16	.....	.....	17
Professors.....	7	67	19	.....	125
Associate Professors.....	.....	2	6	.....	8
Assistant Professors.....	.....	63	7	.....	70
Instructors.....	.....	89	25	33	147
Assistants.....	.....	30	4	31	65
Lecturers.....	.....	.....	18	.....	18
Total.....	8	267	79	96	450

The Medical Faculty.—The University relations and salaries of clinical men in Medical Departments constitute a problem in all institutions which are conducting medical courses. In many cases city hospital services are so subdivided that a medical school in order to gain access to clinical material is compelled to take upon its staff an excessive number of clinical men. This has been true of the College of Medicine and Surgery in the University of Minnesota. The process of gradual

unification of medical teaching has also had its influence in creating a large and unwieldy staff. The teaching can not fail to suffer from the fragmentary character of courses in which so many instructors participate. It is to be hoped that as the College is now in control of its own hospital, and with the better organization of the hospital service outside, the Faculty may be reduced to a much smaller number of men.

Ratio of teachers to students.—There is no common standard by which such ratios can be established for purposes of comparison between institutions. A rough method of approximate estimate may, however, be employed. If all assistants and all part time and administrative officers be counted as one-half, and if all students who attend for less than the regular year be counted as one-half, the Faculty of the University of Minnesota for the year 1910-11 would be reduced to the equivalent of 322, and the students to 5,186, which would yield a ratio of one teacher to every sixteen students. In 1910-11 the ratio in the University of Wisconsin was one to twelve. The report of the Carnegie Foundation for the Advancement of Teaching published in 1908 gives the following ratios for the institutions listed: Columbia University, 1 to 7.3; Harvard University, 1 to 7.0; Yale University, 1 to 9.0; Pennsylvania, 1 to 9.8; Stanford University, 1 to 8.5; Michigan, 1 to 15.0; Illinois, 1 to 8.7; California, 1 to 8.5.

Although the method employed is far from accurate, the ratio of one to sixteen for Minnesota is probably a close approximation. It should be remembered that this figure for the whole institution, including the Schools of Agriculture, would vary in a marked way in different colleges of the University. The figures point clearly, however, to the conclusion that the University of Minnesota is undermanned. The further question as to the amount of work exacted of each instructor has an important bearing on this question of ratio. If teachers are expected to do more work than they can efficiently accomplish, the ratio fails to disclose what is really in teaching efficiency a much more serious situation. The question of amount of work for teachers will be discussed in another place.

Percentage of Minnesota-trained men.—A true university is characterized by cosmopolitan culture in which a wide variety of influences is represented. Provincialism in intellectual life

is unfortunate. Table II shows the numbers and percentages of the teaching staff of the University of Minnesota who have received their academic training in this University. This table is based upon the Faculty as constituted on August 1, 1912. Clinical instructors have been omitted from the calculation. The table shows that approximately 30 per cent of the Faculty have received all their degrees from the University of Minnesota. This takes no account of a considerable number who without being candidates for degrees have studied in American and European universities. This is not a particularly striking percentage. It is probably considerably lower than the percentage would be in one of the older eastern universities. It is to be remembered, however, that the University of Minnesota is a relatively young institution and that for that reason the percentage ought to be distinctly lower than that for Harvard, Yale, or Princeton. The high percentage of instructors (39 per cent) points to the probability that the small salaries available have led to the appointment of assistants at low stipends immediately after graduation, and that these assistants have been advanced to instructorships without having an opportunity for graduate study in some other university. While there are exceptional cases that defy all rules, it is a sound principle that men should rarely receive all their formal training in one institution. When Minnesota chooses its own graduates, it should make selection almost wholly from men and women who have been tested and approved by graduate work in other universities.

TABLE II. SHOWING THE NUMBERS OF THE TEACHING STAFF WHO HAVE TAKEN A FIRST DEGREE OR AN ADVANCED DEGREE OR ALL THEIR DEGREES AT THE UNIVERSITY OF MINNESOTA

ACADEMIC RANK	TOTAL NUMBER	BACHELOR'S DEGREE	ADVANCED		PROFES- SIONAL DEGREE	ALL THEIR DEGREES	PER CENT WITH ALL DEGREES
			Master	Ph.D.			
Professors.....	139	6	5	...	7	31	22.3
Associate Professors.....	11	...	...	...	...	6	54.5
Assistant Professors.....	66	9	6	...	1	18	27.3
Instructors*.....	138	1	4	...	2	54	39.1
Totals.....	354	16	15	...	10	109	30.7

*Clinical instructors are omitted from this group.

Salaries and a salary scale.—In spite of marked increases in salaries during the last five years, the salary scale at the University of Minnesota is distinctly below the point where many strong men and women from without can be successfully called to the institution, and able men within given adequate support and encouragement. The strength of the University lies in the personnel of its teaching staff. The buildings and equipment are of secondary importance. Increases in salary, however, must be adjusted as wisely and fairly as possible to individual capacity and achievement. A uniform salary scale with automatic promotions on the basis of term of service has a deadening effect upon the life of an institution. To grant promotion in rank in lieu of salary tends to fill the upper levels with men who do not belong there. A scale which recognizes for each rank a minimum and maximum is desirable, but within these limits salaries should be adapted to individual cases. It is the business of the University in fixing salaries to make wise and just discriminations. Seniority should not be allowed to stand in the way of the advance of young, vigorous, and growing men. It is the painful but unavoidable duty of the administration to make it clear to certain of the staff that they have already reached the limits of rank and salary which they may expect from the University.

Retiring allowances and life insurance.—The system of retiring allowances provided by the Carnegie Foundation for the Advancement of Teaching is often misunderstood and misinterpreted. There are two grounds for retirement, age and disability. At sixty-five a teacher in active service may be retired provided he has served in an accepted institution not less than fifteen years as a professor, or twenty-five years either as an instructor or in both grades. For retirement on the score of disability he only is eligible who has served not less than twenty-five years as professor or thirty years as instructor and professor. A widow receives an allowance only in case she had been married to her husband for ten years, and he at the time of his death was either receiving an allowance or was eligible for it. Her allowance is one-half that paid to her husband. To suppose, therefore, that a retiring allowance is in any sense a substitute for life insurance involves serious confusion of thought. It is of importance to the academic teacher that he should insure his

life as fully as he can, at least up to the time when he will at sixty-five be eligible for retirement.

The full time of a college teacher.—The question as to what constitutes full service of college teachers is full of difficulties. By the layman the professor's life is sometimes jocularly, more often seriously, described as one of leisure. That some college teachers neglect their duties and shirk their responsibilities can not be denied. The percentage is probably lower than in other salaried callings. The time-clock criterion can not be successfully applied to college professors. To judge a man's service by the actual number of hours per week which he spends in class-room or laboratory is seriously to misinterpret college and university work. This test takes no account of the hours devoted to administrative duties, to service on committees and boards. It makes no reckoning of the reading of papers and examination books, or, where this is done by assistants, of the careful supervision of their work. It ignores the time devoted to personal conferences with students and, in advanced work, to direction of their special studies and independent investigations. It fails to include the many hours which must be devoted to study and to the preparation by means of which a man continues to grow and to keep abreast of the advances in his special field. The class-room laboratory test overlooks the time which should be given to the investigation and the publication which are expected of a university man. Judged by the standards of the leading institutions, the staff of the University of Minnesota are as a whole doing more than they should be expected to do if they are to escape from the deadening effect of too much mechanical work. There is in one department, for example, a group of instructors who are required to devote forty-two hours a week each to class-room teaching and the theme reading involved in their instruction. In another department individual schedules run in some cases to forty-eight hours per week. The situation points to several conclusions. In many cases the amount of teaching done and its accompanying obligations should be reduced. A number of men should be freed from purely routine duties and given opportunities for the research of which they are capable. The only way in which the relief can be afforded is obviously by the increase of the numbers of the teaching staff. Estimates

concerning the ratio of teachers to students will be found in another part of this report. (Page 18.)

Outside service.—But even when a university man is doing all that can be reasonably expected in return for his salary, there remains a margin of time and energy which ought to be at his disposal. There are many forms of remunerative activity in which he may legitimately engage. He may give lectures of an educational character, he may write books the royalties of which give him an income, he may, especially if he be a member of one of the professional schools or colleges, render expert service. The tests as to whether these activities are legitimate or not are: 1st, do they interfere with the proper discharge of the primary obligation to the university? 2d, are the activities of a nature to increase the efficiency of the man himself, as a teacher, as a director of research, as an administrator? When these two questions can be answered in the affirmative, men should be encouraged to engage in so-called "outside" service. To limit the staff of a university to men whom no one else values or desires to consult, would be to condemn our institutions of higher education to the isolation of plodding mediocrity.

Publications by members of the faculty.—On page 261 *et seq.* appears a list of books, articles, and reviews written by members of the Faculty of the University of Minnesota and either published during the year or in press, on August 31, 1912. This list is not so long or so impressive as could be desired. The relative meagreness of the showing affords further proof of the fact that too many men are overburdened with teaching and administrative duties. The spirit of investigation and production can not be fostered in an atmosphere of over-work and of deadening routine. The University must find relief from such burdens for the men who are capable of productive scholarship. It should be remembered, however, that research and publication are not the only tests of efficient service. The University owes much to scores of men and women who are devoting their time and energies to faithful and inspiring instruction. It would be unfortunate to set up any one standard, least of all the standard of publication, as the criterion of value to the University. The evidences of successful teaching are recorded in the lives of students who are stirred to intellectual effort and who go into life with higher intelligence and loftier purpose. These records

can not be translated into statistical tables nor turned into printed pages.

Housing conditions for members of the Faculty.—It is important that so far as possible members of the Faculty reside in the immediate vicinity of the University. There should be an academic community, and this is impossible unless large numbers of the Faculty live in association. The University district does not provide a sufficient number of houses for the needs of the present staff. When men are approached with invitations to come to the University of Minnesota, one of their questions is as to living quarters. One or two modern apartment houses in the southeast district would undoubtedly meet a real demand. It is even probable that three- or five-year contracts with tenants could be made in advance. The situation unquestionably affords opportunity for a good investment and for rendering a needed service to the University community.

The Campus Club.—The opening of the Campus Club on the University grounds has provided a center for social intercourse. A half dozen men live in the House. Scores frequent the house for luncheon. Faculty committees find the Club a convenient meeting point. The institution will contribute steadily to a growing feeling of unity and common interest on the part of the teaching staff of the University. The Club pays rent to the University for the Club House, and by fees and service charges meets all expense of maintenance.

THE STUDENTS

Health conditions among students.—The University has a duty with reference to the personal health of its students and the public health of the community. The present situation is unsatisfactory. The question of health jurisdiction is not clearly defined. The officers who deal with the physical condition of the students are not related in any organized way. Physical examinations can not be made so promptly as they should be. The gymnasium facilities for women are utterly inadequate and unsatisfactory. The quarters for men are far from meeting the standard of the best institutions. There have been no serious outbreaks of contagious or infectious diseases during the year. Many of the boarding houses of the southeast district

have been given a sanitary inspection and in many cases conditions have been improved. The fact that many students are living at home makes the situation less serious than it would be if almost the whole student community were non-residents. The local distribution of students is shown on page 36. As soon as funds are available the University should be organized into a model sanitary district and an officer should be put in charge. A student infirmary should be established, and every measure taken for affording to the students of the University efficient health supervision and adequate care in case of sickness.

Housing of students.—A reference to the map, page 36, shows that 1,684 students were living in November, 1911, in the vicinity of the University. For these the University provides in Sanford Hall resident accommodations for 90 women. The restaurant in Alice Shevlin Hall serves luncheon daily for about 450 women. Fraternity and sorority houses provide quarters for approximately 400 students. The remainder must find rooms and board in about 50 boarding-houses and in large numbers of private families. The reports of the inspectors make it clear that too many students are living in crowded, ill-ventilated, inadequately heated rooms. There is a real need for better quarters for this group of students. It is to be hoped that in the near future the University will be able to provide sufficient dormitory accommodations for all women who are not living at home. A dormitory system for men should be established as soon as the resources of the University permit. Meantime there is opportunity for private enterprise which would combine investment with philanthropy. Private dormitories of simple but substantial construction in which students might find all the essentials of healthful living would, it is confidently believed, make a safe return upon the investment. Plans are now being worked out and will be submitted to men and women who it is hoped will be willing to make the experiment. The University has a duty to the student community and must do what it can to insure living quarters that shall be healthful, socially desirable, and morally safe.

Loan funds and scholarships.—The report of the Gilfillan Trust from the beginning shows that \$31,431.00 has been loaned to students during the last ten years. Of this amount the sum of \$11,281.29 has been repaid. This fund has

been of great value. Other loan funds, such as the Ludden Trust, have been of important service. For the year 1911-12 loans were made as follows: Gilfillan Trust, \$5,052; Ludden Trust, \$300; Elliot Trust, \$400. There is no way in which citizens of the State who desire to assist ambitious and deserving students to take advantage of the education which the State provides can do more to co-operate with the University than in providing loan funds of this sort. To select a student for higher education solely on the basis of his ability to pay his way through the University would be disastrous. To compel earnest students to devote a large part of their time and energy to self-supporting work is to develop their strength of character too often at the expense of both health and successful intellectual effort. Scholarships and loan funds are therefore meeting the most important needs of the institution. A movement is on foot among the alumni of the Law School to create a loan fund for the students of that division. It is to be hoped that the various colleges will be able to secure from their graduates funds of this sort as well as free scholarships.

A University employment bureau.—A vocational census made last spring showed among others the following interesting results: Four hundred and ninety-four men and eight hundred and forty-one women filled out question papers which made a list of inquiries about plans for the future and about personal expenses and individual earnings. Of the 1,335 students who reported, 96 per cent gave facts about their incomes. Sixty-four per cent of the men reported that they were earning a part or the whole of their way through college. Among the students who come from farms, 78 per cent were meeting wholly or in part their college expenses. Of the women 15 per cent said that they were earning something at least toward their own maintenance. The aggregate earnings reported by these students were \$94,000, an average equivalent for the men of \$306 each and for the women of \$191. Of the occupations the largest number report employment as canvassers, salesmen, or clerks. The next source of revenue was employment in agriculture. Other employments in the order of their importance were newspaper work (including distribution), teaching, bookkeeping and accounting, drug store service, housekeeping, skilled trades, and railroad offices.

The facts concerning self-support are striking. The two cities provide unusual opportunities for employment. If students are not compelled to give too much time to outside work, a measure of self-support is of value in cultivating will-power and self-reliance. The University should do all in its power to find for its students who desire work the best opportunities. At present the College of Education conducts a bureau for the placing of University graduates in teaching positions. The Y. M. C. A. serves as a clearing-house for the employment of men students. The Dean of Women acts in a similar capacity for University women. The question arises, however, as to whether the time has not come for the establishment of a regular employment bureau under the charge of an officer who gives his whole time to the work of finding fairly paid and safe employment for students and graduates of the University.

Scholarship of students.—The importance of maintaining a satisfactory grade of scholarship has been emphasized during the year. As in other institutions the methods of appraising scholarship vary widely with different colleges, departments, and even instructors. The whole subject of markings deserves careful study. It is to be hoped that the University Senate, through a special committee, will attempt to deal with this problem. (Page 13.) During the year, 176 students were dismissed for delinquencies in scholarship. (See Table III.)

TABLE III. STUDENTS DISMISSED FOR POOR SCHOLARSHIP, 1911-12

COLLEGE	MEN		WOMEN		TOTALS	
	Registered	Dropped	Registered	Dropped	Registered	Dropped
Science, Literature, and the Arts.....	690	73	1008	29	1698	102
Engineering.....	356	21	.....	.....	356	21
Agriculture.....	184	7	200	3	384	10
Law.....	203	24	6	1	209	25
Medicine.....	177	3	29	.....	206	3
Dentistry.....	244	.....	3	.....	247	.....
Pharmacy.....	74	2	1	.....	75	2
Mines.....	98	3	.....	.....	98	3
Chemistry.....	78	10	3	.....	81	10
Education.....	6	.....	84	.....	90	.....
Graduate.....	14	.....	89	.....	103	.....
Total.....	2124	143	1423	33	3547	176

The rules have been enforced with efficiency and without any yielding to pressure. The regulations undoubtedly result in the elimination of weak students. There is always the danger,

however, that a few promising students will be included in these more or less automatic dismissals. It is to be regretted that conditions in a modern University make some kind of mechanism necessary. When large numbers must be dealt with by an inadequate staff, an educational machine is the result. The committees in the various colleges devote an immense amount of time to the careful consideration of individual cases. If the results are then mechanical, it is not because the officers concerned have failed in their duty. The difficulty lies in the situation itself. It is to be hoped that in the early future there may be added to the staff preceptors who can give personal attention to students who are failing in their work. If such students could be placed upon a probation list and required to report daily to preceptors, there is no doubt that a considerable number of those who are now automatically dismissed might be helped to find themselves, and to develop their latent abilities, overcome bad habits of study, and grow into really able and efficient men and women. The University can not rest content with being a teaching machine. It must become a community of teachers and students. This will demand more men and women and appropriate salaries.

This increased service is needed not only for students who are failing in their work, but perhaps even more for the encouragement of those who with friendly guidance and stimulation might achieve much more in their college course. The student of unusual ability who rests content with mediocrity of work is quite as unfortunate as one of limited ability and defective training who is merely struggling to remain in college. The University has an obligation to its able students as well as to those who are weak. Prizes and scholarships are of value in rewarding intellectual achievement. The University is fortunate in already possessing a limited number of these rewards. (See pages 24 and 210.) It is hoped that friends of the institution and of learning will add to the number of these prizes and scholarships.

Relations of Faculty and students.—Reference has already been made to the importance of making a university more than a teaching machine. Personal relations between faculty and students must be made natural and easy. No system of assigning so many freshmen to each member of the Faculty is likely to show tangible results. Administrative officers, deans, or

preceptors must be appointed to give a large part of their time to conferences with students and to bringing them into contact with those members of the Faculty from whom they may gain the most in the way of guidance, suggestion, and inspiration. Again, it should be noted that the various faculty committees have not spared themselves in any way, but under almost overwhelming conditions have devoted an immense amount of time and patient consideration to individual cases.

The Students' Council.—During the year a Council of Students representing all the colleges of the University has been organized. This Council is designed to lead and represent student opinion. In all the large universities, the old days of faculty coercion have passed. Community control must depend upon mutual respect, upon frank conference, and upon friendly co-operation between students and Faculty. The organization of the Students' Council is an auspicious and welcome movement in the direction of organized student participation in the life of the institution. Several colleges have their own Councils to deal with the problems which are peculiar to the separate divisions.

The Minnesota Union.—The women of the University find in Alice Shevlin Hall a social center, a place for study, for refreshment, and for comradeship. The men of the institution have no corresponding headquarters. The fraternity houses can serve only their own members. The only centers for men are cigar stores, newsrooms, restaurants under private auspices, run by proprietors whose primary interest is commercial. The Minnesota Men's Union is preserving its organization with the hope that a building for men can be secured. Such a building is to be found in most of the leading universities of the country. These houses are not places for mere idling. They are centers which afford organization rooms, study rooms, toilet facilities, space for games, and conditions for comradeship. The University of Minnesota can not do its full duty by its students until it can provide a building around which the life of the men can organize itself.

Fraternities and sororities.—These organizations under existing conditions render unquestioned service in student life. They provide rooms and board for a considerable number of students (about 400). They afford opportunity for comradeship. They

exercise a control over their members. They cultivate loyalty and are centers for the development of the University spirit. On the other hand, they involve certain dangers. They tend to waste the time of their members. They fall easily into a kind of snobbery. They often lower rather than maintain the moral standard of the community. They may divide the student body and foster ill-feeling. In short, fraternities and sororities are like all human institutions,—under the right sort of leadership and guidance they may be a source of strength; under other conditions they may be a menace. The year has been marked by increased interest in the fraternity situation. The alumni and heads of the departments are showing an attitude of concern for them and their members. Fraternity finances are being put on a more business-like basis. The comparative scholarship reports with which the fraternities have been supplied have stimulated a desire to make a better showing. The Interfraternity Council has shown an increased sense of responsibility. (See report of the President of the Interfraternity Council, page 187.)

The sororities have adopted a rule which ought to minimize some of the evils that have heretofore been encountered. Hereafter new members will not be pledged until the end of the freshman year. This ought to raise the level of seriousness and scholarship in sororities and discourage the entrance into the University of the type of young woman who attempts a year of college work purely with the idea of gaining coveted membership in a sorority. The University must assume toward these organizations an attitude of co-operation. It must regard them not as evils to be endured but as possible agencies of good to be encouraged. Constant vigilance, however, on the part of graduate leaders, undergraduates, and University committees is necessary if the advantages of these groups are to be secured and the dangers to be minimized.

Student activities.—The students of the University maintain eleven literary societies; thirteen associations for various purposes of self-government, racial loyalty, and self-improvement; four religious associations; twenty-one clubs organized about interests and activities. The student community supports five regular publications; there are in active existence forty fraternities (including the professional fraternities and three honor

societies) and ten sororities. The appeal of all these interests and organizations may well be distracting. The Dean of Women reports a wise attempt on the part of the self-government association to limit the number of activities in which any one woman may engage. A similar restriction upon the social and other enterprises of men has been at least discussed by the Interfraternity Council. The scholarship reports unquestionably reflect the influence of these many appeals which are made to students. On the other hand many of these clubs and the activities which they foster undoubtedly afford under reasonable conditions valuable training, widen sympathy, discover latent abilities, and provide an important discipline. A University should be a community in which many tastes, aptitudes, and pursuits gain recognition. Such organizations as the Masquers (the Dramatic Club), the Glee Club, the Cadet Band, the Agricultural Club, the Students' Council, the Students' Government Association, give their members important training. The interest which many students take in public speaking and debating is to be heartily welcomed. The leading students in the different colleges show a gratifying ability to speak in public clearly and to the point.

Ethical standards among the students.—The University fails signally if it neglects to develop in its students a discriminating intelligence and a sound feeling with regard to moral questions. A morality which satisfies itself with fine phrases and formal praise of lofty ideals, and evades the concrete moral questions that arise in daily life is no better than hypocrisy. College life offers many problems, problems of honesty in student work, of strict integrity in handling student finances, of sensitive honor concerning athletic contests, of individual responsibility for the repute and welfare of the institution, problems of personal morality, self-discipline, of consideration for one's fellows, and the growth of loyalty from that of the gang into the wider reaches of public spirit and the obligations of service. Student feeling concerning moral questions is essentially sound and trustworthy when judgment is not swept away by temporary feeling or confused by a clouding of issues. It is the duty of a University administration to see to it that moral questions are clearly analyzed, that confused thought is clarified, and that vital moral issues are pressed home and a decision insisted upon.

In this work of making clear-cut discriminations and of influencing moral judgments the co-operation of the students through their councils and their leaders is essential. More and more the University authorities must rely upon the aid of the students in the work of defining moral issues and rallying student opinion to the support of what is clean, honest, fair, just, considerate, and disinterested.

STATISTICS OF REGISTRATION, ETC.

Collegiate students.—Table IV shows the registration, for each of the years 1910-11 and 1911-12, of all students of collegiate grade, i. e., those who are pursuing courses based upon a full four-year high school preparation. The net loss of 54 for the year 1911-12 is due primarily to the full effect of substituting a five-year for a four-year course in Engineering and to the enforcing of the two-year college prerequisite and the drastic reorganization of instruction in the Law School. In so far as the decrease reflects a higher standard of educational efficiency it is to be heartily welcomed. The significant gains are in the College of Science, Literature, and the Arts, and in the College of Dentistry. The latter has been compelled to fix a limit to its number of students. An increase of 10 per cent in the enrollment of graduate students is gratifying.

TABLE IV. COLLEGIATE STUDENTS BY COLLEGES AND SCHOOLS, 1910-1912

COLLEGE OR SCHOOL	YEAR 1910-1911			YEAR 1911-1912			GAIN	LOSS
	Men	Women	Total	Men	Women	Total		
COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS:								
Seniors	64	150	214	95	165	260	.....	.....
Juniors	68	174	242	121	197	318	.....	.....
Sophomores	166	233	399	193	294	487	.....	.....
Freshmen	240	277	517	305	308	613	.....	.....
Unclassed	172	77	249	28	52	80	.....	.....
Total	710	911	1621	742	1016	1758	137	.....
COLLEGE OF ENGINEERING AND THE MECHANIC ARTS:								
Post Senior .....	.....	.....	.....	17	.....	17	.....	.....
Seniors	70	.....	70	56	.....	56	.....	.....
Juniors	69	.....	69	66	.....	66	.....	.....
Sophomores	79	.....	79	96	.....	96	.....	.....
Freshmen	144	.....	144	121	.....	121	.....	.....
Unclassed	58	.....	58	21	.....	21	.....	.....
Total	420	.....	420	377	.....	377	.....	43

TABLE IV—Continued

COLLEGE OR SCHOOL	YEAR 1910-1911			YEAR 1911-1912			GAIN	LOSS
	Men	Women	Total	Men	Women	Total		
COLLEGE OF AGRICULTURE:								
Graduates.....	6	.....	6	14	2	16	.....	.....
Seniors.....	30	9	39	22	14	36	.....	.....
Juniors.....	35	15	50	29	10	39	.....	.....
Sophomores.....	53	45	98	64	32	96	.....	.....
Freshmen.....	102	123	225	70	83	153	.....	.....
Normal.....	.....	.....	.....	.....	65	65	.....	.....
Special Students.....	4	12	16	6	6	12	.....	.....
Total.....	230	204	434	205	212	417	.....	17
LAW SCHOOL:								
Graduates.....	14	.....	14	.....	.....	.....	.....	.....
Seniors (Day).....	112	1	113	53	.....	53	.....	.....
Middle Class (Day).....	56	.....	56	90	2	90	.....	.....
Juniors (Day).....	79	.....	79	74	1	75	.....	.....
Fourth year (Night).....	.....	.....	.....	29	1	30	.....	.....
Third year (Night).....	30	1	31	22	1	23	.....	.....
Second year (Night).....	17	2	19	23	1	24	.....	.....
First year (Night).....	21	1	22	28	.....	28	.....	.....
Special.....	108	.....	108	.....	.....	.....	.....	.....
Total.....	437	5	442	319	6	325	.....	117
COLLEGE OF MEDICINE AND SURGERY:								
Graduates.....	5	.....	5	3	.....	3	.....	.....
Sixth year.....	24	1	25	35	1	36	.....	.....
Fifth year.....	35	1	36	42	4	46	.....	.....
Fourth year.....	50	4	54	38	2	40	.....	.....
Third year.....	47	4	51	60	2	62	.....	.....
Hamline Medical.....	6	.....	6	.....	.....	.....	.....	.....
Total.....	167	10	177	178	9	187	10	.....
SCHOOL FOR NURSES:								
.....	.....	17	17	.....	22	22	5	.....
COLLEGE OF DENTISTRY:								
Third year.....	50	.....	50	58	.....	58	.....	.....
Second year.....	63	.....	63	66	.....	66	.....	.....
First year.....	81	.....	81	102	3	105	.....	.....
Unclassed.....	12	.....	12	18	.....	18	.....	.....
Total.....	206	.....	206	244	3	247	41	.....
COLLEGE OF PHARMACY:								
Seniors.....	34	6	40	26	1	27	.....	.....
Juniors.....	41	3	44	43	.....	43	.....	.....
Unclassed.....	6	.....	6	6	1	7	.....	.....
Total.....	81	9	90	75	2	77	.....	13
SCHOOL OF MINES:								
Seniors.....	27	.....	27	24	.....	24	.....	.....
Juniors.....	26	.....	26	17	.....	17	.....	.....
Sophomores.....	25	.....	25	14	.....	14	.....	.....
Freshmen.....	12	.....	12	22	.....	22	.....	.....
First year.....	15	.....	15	21	.....	21	.....	.....
Total.....	105	.....	105	98	.....	98	.....	7
SCHOOL OF CHEMISTRY:								
Seniors.....	15	.....	15	18	.....	18	.....	.....
Juniors.....	14	1	15	17	1	18	.....	.....
Sophomores.....	12	.....	12	7	.....	7	.....	.....
Freshmen.....	11	.....	11	16	1	17	.....	.....
First year.....	20	.....	20	14	1	15	.....	.....
Unclassed.....	.....	.....	.....	6	.....	6	.....	.....
Total.....	72	1	73	78	3	81	8	.....

TABLE IV—Continued

COLLEGE OR SCHOOL	YEAR 1910-1911			YEAR 1911-1912			GAIN	LOSS
	Men	Women	Total	Men	Women	Total		
COLLEGE OF EDUCATION:								
Graduates.....	12	1	13	8	5	13	....	....
Seniors.....	8	28	36	2	38	40	....	....
Juniors.....	2	22	24	2	33	35	....	....
Unclassed.....	11	28	39	2	13	15	....	....
Total.....	33	79	112	14	89	103	....	9
GRADUATE SCHOOL:								
Graduate Students....	94	50	144	101	58	159	15	....
SUMMER SCHOOL:								
College Section.....	188	269	457	227	250	477	20	....
College Summer School (Agriculture).....	....	....	....	25	45	70	70	....
Grand total of colle- giate students, less duplicates.....	2642	1469	4111	2470	1587	4057	....	54

Sub-collegiate students.—Table V exhibits the registration figures for sub-collegiate students. The large gain in totals is due to the rapid expansion in the summer school for grade teachers, and the inauguration of a popular junior short course. Too much stress should not be laid upon these fluctuations in short course attendance. The registration in the regular six months' Schools of Agriculture, it will be noted, is the same for both years. Table VI shows comparative figures for extension students. The evening classes in Minneapolis and St. Paul are more than holding their own. Correspondence teaching has had little opportunity and can not flourish until a staff and facilities are provided. Obviously the possibilities of extension work—except in Agriculture—have not as yet been grasped.

The general summary.—Table VII should not be given much weight. The totals are misleading. Groups of students so diverse in preparation, educational aim, and length of residence in the University can not be added into totals that have much meaning. For example, the total gain of 923 is practically in sub-collegiate, short-course students. The total to be kept in mind in comparing the University with other institutions is 4,057, the number of collegiate students registered in 1911-12.

Percentage of women students.—In the College of Science, Literature, and the Arts the percentage of women has risen from 56.2 to 57.7, and in the whole body of collegiate students from

35.5 to 38.2. The increase of the percentage of women in the sub-collegiate courses from 23.2 to 50.3 is due to the large increase in the attendance of teachers in the Summer School.

TABLE V. SUB-COLLEGIATE STUDENTS, 1910-1912

SCHOOL	YEAR 1910-1911			YEAR 1911-1912			GAIN	LOSS
	Men	Women	Total	Men	Women	Total		
CENTRAL SCHOOL OF AGRICULTURE:								
Intermediate year.....	8	3	11	18	7	25	.....	.....
Class A.....	82	49	131	106	42	148	.....	.....
Class B.....	147	74	221	227	98	325	.....	.....
Class C.....	374	150	524	247	135	382	.....	.....
Total.....	611	276	887	598	282	880	.....	7
NORTHWEST SCHOOL OF AGRICULTURE:								
Students.....	104	35	139	122	37	159	20	.....
WEST CENTRAL SCHOOL OF AGRICULTURE:								
Students.....	79	26	105	67	24	91	.....	14
Total, Schools.....	794	337	1131	787	343	1130	.....	.....
SHORT COURSES:								
Traction Engineering..	145	.....	145	38	.....	38	.....	107
Teachers' Summer School.....	15	23	38	51	838	889	851	.....
Summer Forestry Course.....	4	14	18	.....	.....	.....	.....	18
Farmers' Short Course..	197	6	203	122	5	127	.....	76
Junior Short Course....	.....	.....	.....	203	107	310	310	.....
Dairy School.....	100	.....	100	96	.....	96	.....	4
School for Supervisors	4	.....	4	.....	.....	.....	.....	4
Total, Short Courses..	465	43	508	535	995	1530	.....	.....
Grand total of sub-collegiate students..	1259	380	1639	1297	1293	2590	951	.....

TABLE VI. EXTENSION STUDENTS, 1910-1912

COURSES	YEAR 1910-1911			YEAR 1911-1912			GAIN	LOSS
	Men	Women	Total	Men	Women	Total		
Economics.....	215	263	13	276	61	.....
Education (Correspondence).....	68	15	17	32	.....	36
Economics (Correspondence).....	4	4	1	5	1	.....
Total.....	287	282	31	313	26	.....

TABLE VII. SUMMARY, 1910-1912

DIVISION	YEAR 1910-1911			YEAR 1911-1912			GAIN	Loss
	Men	Women	Total	Men	Women	Total		
Collegiate Students.....	2642	1469	4111	2470	1587	4057	.....	54
Sub-Collegiate Students..	1259	380	1639	1297	1293	2590	951	.....
Extension Students.....	.....	.....	287	282	31	313	26	.....
Grand Total.....	.....	.....	6037	4049	2911	6960	923	.....

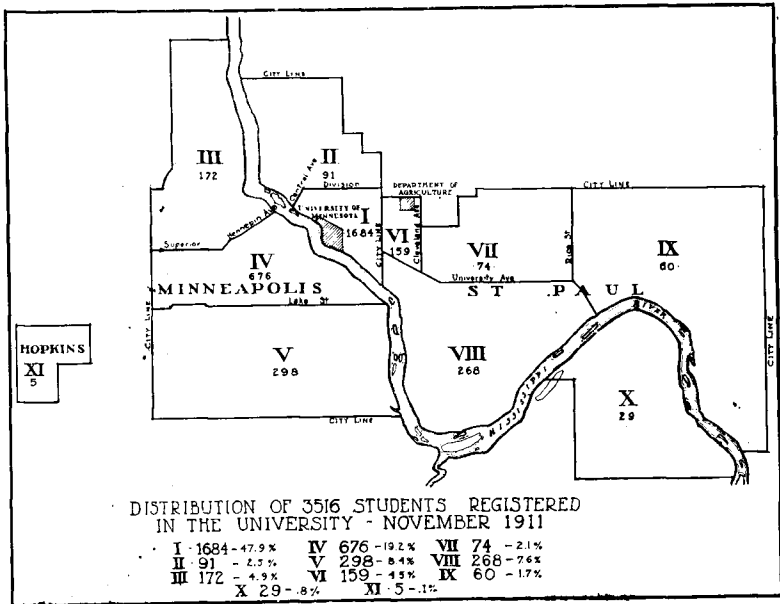
TABLE VIII. DEGREES CONFERRED, 1910-1912

COLLEGES AND DEGREES	YEAR 1910-1911			YEAR 1911-1912		
	Men	Women	Total	Men	Women	Total
SCIENCE, LITERATURE, AND THE ARTS:						
B.A.	55	144	199	64	146	210
B.S.	24	3	27	16	3	19
ENGINEERING:						
C.E.	23	.....	23	5	.....	5
E.E.	29	.....	29	6	.....	6
M.E.	10	.....	10	5	.....	5
B.S. (Science and Tech.) ..	2	.....	2	1	.....	1
B.S. (in Eng.) ..	.....	.....	.....	49	.....	49
AGRICULTURE:						
B.S. (in Agri.) ..	11	.....	11	8	.....	8
B.S. (in For.) ..	17	.....	17	13	.....	13
B.S. (in Home Econ.) ..	.....	9	9	.....	14	14
LAW:						
D.C.L.	1	.....	1	.....	.....	.....
L.L.M.	10	.....	10	.....	.....	.....
L.L.B.	105	.....	105	54	1	55
MEDICINE AND SURGERY:						
M.U.	19	.....	19	36	1	37
*Completed Course ..	6	.....	6	.....	.....	.....
Graduate in Nursing.....	.....	.....	.....	.....	7	7
DENTISTRY:						
D.D.S.	49	.....	49	62	.....	62
PHARMACY:						
Phm.B.	20	3	23	11	1	12
MINES:						
E.M.	26	.....	26	23	.....	23
CHEMISTRY:						
B.S. (in Chem.) ..	10	.....	10	13	.....	13
B.S. (in Chem. Eng.) ..	3	.....	3	.....	.....	.....
Chem.E. ....	.....	.....	.....	2	.....	2
B.S. ....	.....	.....	.....	3	.....	3
EDUCATION:						
B.A. (in Educ.) ..	7	27	34	2	39	41
GRADUATE:						
M.A.	15	11	26	11	11	22
M.S.	5	2	7	8	.....	8
Ph.D.	1	.....	1	2	.....	2
M.F. ....	.....	.....	.....	1	.....	1
Grand Total.....	448	199	647	395	223	618

* Received degree from Hamline University.

Degrees conferred.—In Table VIII appear lists of degrees conferred in all colleges and schools for each of the years 1910-11 and 1911-12. In the College of Science, Literature, and the Arts the loss in the B.S. is a little more than made up by the gain in the B.A. Engineering shows the readjustment to the new degree B.S. (in Engineering). The heavy loss in Law reflects the changes which have been going on in that School. The sharp rise in Medicine and Surgery shows that this College has readjusted itself to its new standards. The increase in Dentistry discloses the enlarged demands which are being made upon that College.

Local distribution of students.—The accompanying outline map shows where the 3,516 collegiate students registered in November, 1911, were living. Of the 1,684 who were quartered in the district immediately surrounding the University Campus 332 men were lodged in fraternity houses, 62 women in sorority



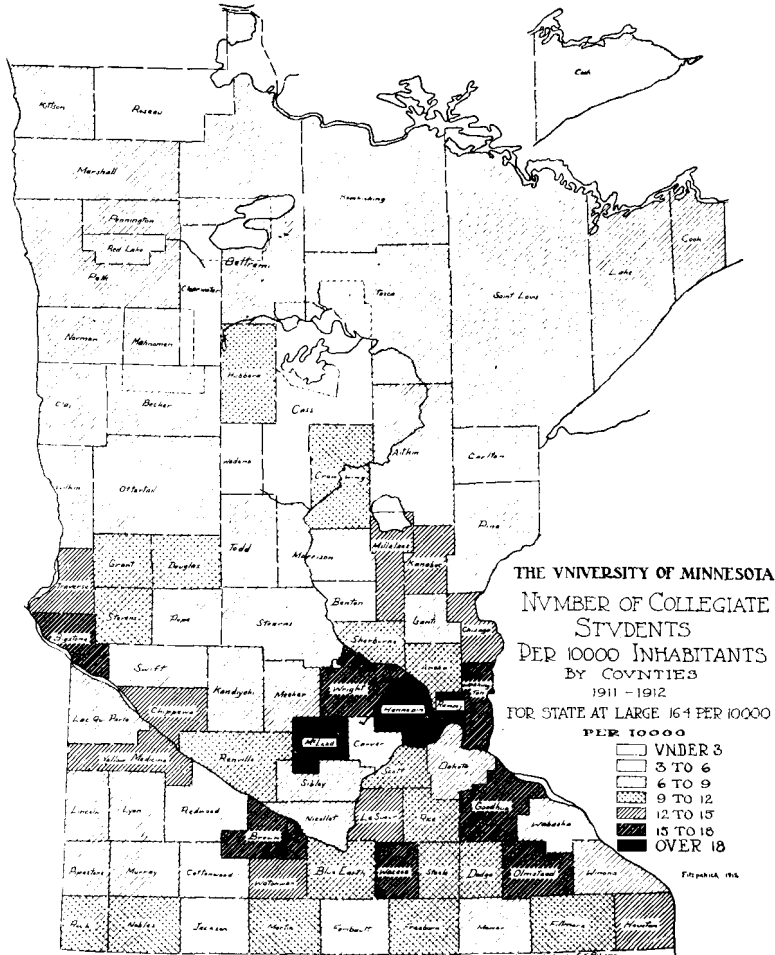
houses, and 90 women in Sanford Hall, the University dormitory for women. Of the remaining 1,200 students a good many undoubtedly were living at home or with relatives. It is safe to conclude that between one thousand and eleven hundred

students find their quarters in boarding houses or with private families in the southeast district. Of the students whose addresses fall in other sections of the two cities and their suburbs, the overwhelming number unquestionably live either with their parents or with relatives. A detailed study of the living conditions of students at the University is being planned. Results will be published in the next report of the President.

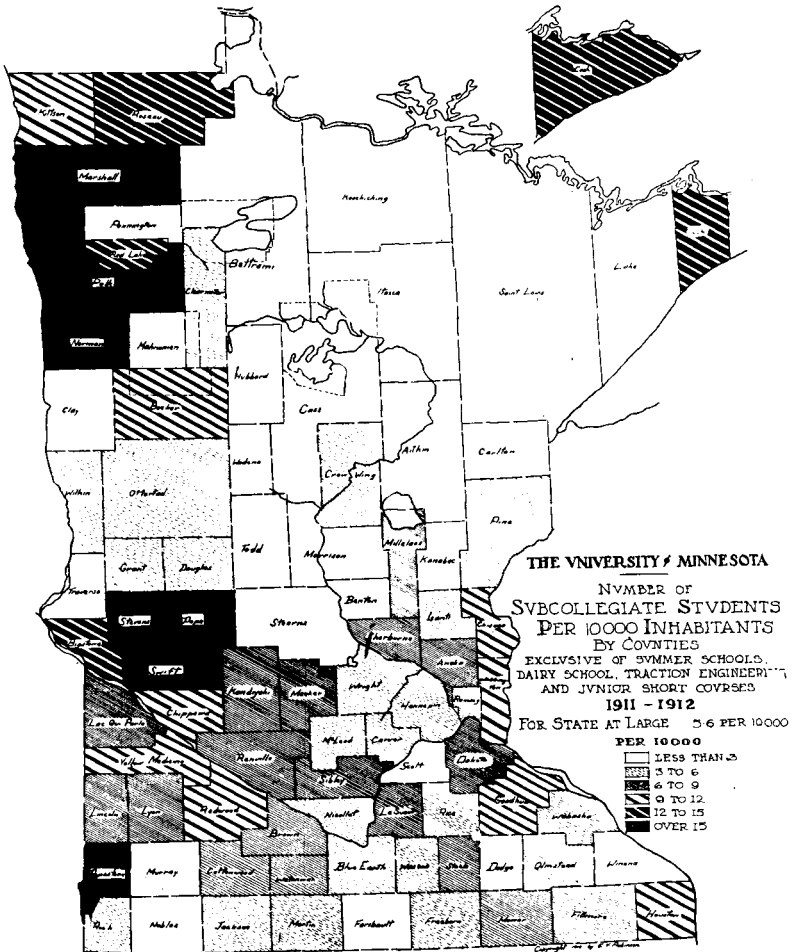
Geographical distribution of students.—Table IX shows the geographical distribution of all collegiate students save those of the summer session, and of the sub-collegiate students at the Central School of Agriculture, at the Northwestern School of Agriculture, at the West Central School of Agriculture, as well as the attendants upon the Farmers' Short Course at the Central School. The facts concerning the geographical distribution of Junior Short Course and other students are not all complete and available. It will be noted that of the collegiate students 392, or 10.4 per cent, come from outside the State of Minnesota. Of all the collegiate students 55.9 per cent are registered from Hennepin and Ramsey counties. If students from outside the State be deducted, of the remainder 62.4 per cent come from these two counties. Of the sub-collegiate students recorded in the table, 22.4 per cent are registered from Hennepin and Ramsey counties. If the two groups be combined, the percentage from the two cities and vicinity is 47.8 per cent. About 26.8 per cent of the population of the State live in this region. A per capita distribution of students therefore would naturally call for at least the same percentage from these two counties. The fact that this percentage is markedly exceeded is to be attributed not only to the fact of proximity, but undoubtedly to a considerable degree to the immigration of families who come to Minneapolis and St. Paul for the specific purpose of entering their sons and daughters in the University. The apparent concentration is still further emphasized by the fact that more advanced students have a habit of registering from the cities even though their actual homes are in other parts of the State or in other states. The validity of this view is proved by the statistics of high school preparation. While 55.9 per cent of the students were registered from Minneapolis and St. Paul, only 40.8 per cent were prepared for the University in the High Schools and preparatory schools of these two

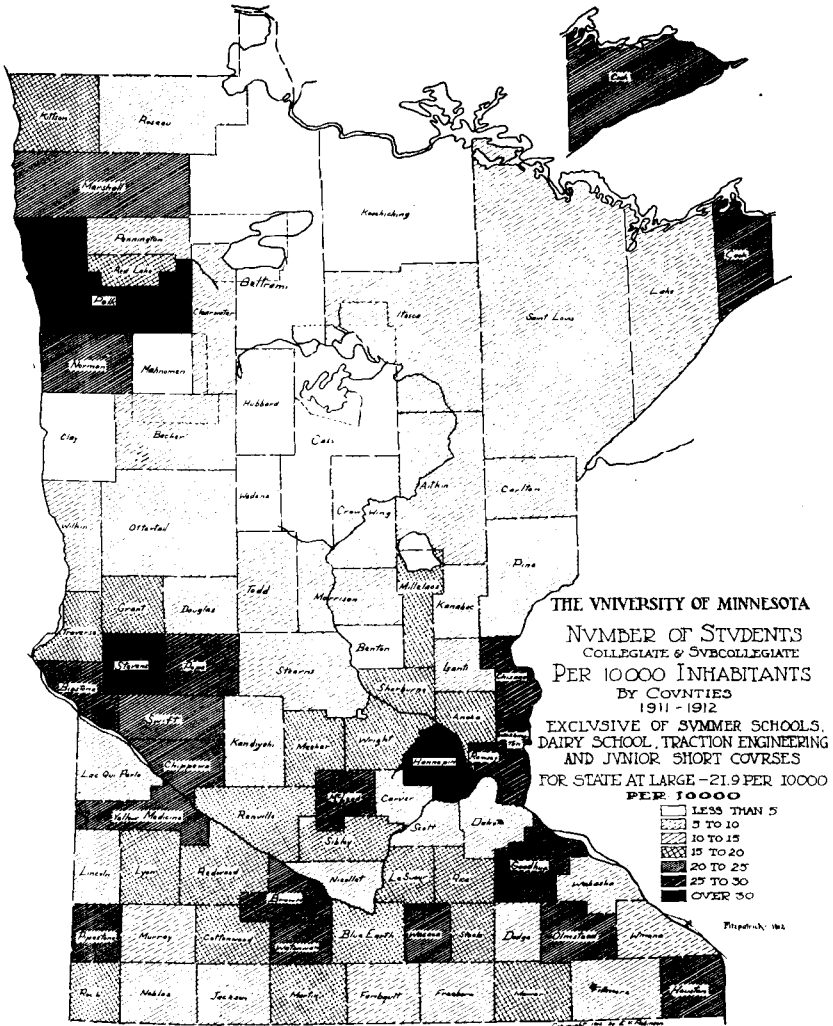
cities. So, too, while 33.8 per cent report their residences from outside the cities, 39.2 per cent were prepared in outside High Schools. As to the 10.4 per cent who give their residences as outside of Minnesota 17.9 per cent were actually prepared in secondary schools beyond the boundaries of the State. These figures make clear the tendency of families and individuals to move from the towns and villages of the State into the urban centers and then to give their addresses as permanent residents of Minneapolis and St. Paul. The significant fact is that Minneapolis and St. Paul High Schools prepare for the University only 10 per cent more students than the per capita distribution of population would assign to them. The maps on pages 39 to 41 show in graphic form the per capita distribution of students by counties.

Average ages of students.—The average age of all first-year students of collegiate grade (except those of the Graduate School) entering the University is 20.36 years. This average varies with the different colleges and schools. The average ages for the several divisions are as follows: Science, Literature, and the Arts, 19.38; Chemistry, 19.41; Engineering, 19.91; Mines, 20.15; Agriculture, 20.38; Dentistry, 21.35; Pharmacy, 21.99; Law (after two preparatory college years), 22.09; Medicine (after two college years), 23.06; Education, 25.10. In the College of Science, Literature, and the Arts the average age of the men is 19.73; of the women, 18.90. As compared with six years ago, there is a slight increase in the average age of men, which in 1906 was 19.63. The average age of women in the same period has declined from 19.26 six years ago to 18.90 at the present time. The average age of all students, however, in this College remains practically what it was six years ago, i. e., 19.38 at present compared with 19.41 in 1906. On Commencement Day, June 12, 1913, the average age of the senior class in the College of Science, Literature, and the Arts will be 23.62. The average deviation from the average age varies in different colleges. This deviation means the average difference between the ages of the individuals of the group and the average age of the whole group. The freshmen in the Arts College vary on the average only 1.28 years from 19.38 years, the average for the whole class. These freshmen are "nearer of an age" than medical freshmen, whose average variation is 2.04.



NOTE.—This and the following maps were prepared under the direction of Assistant Professor Louis D. Weld by the statistical laboratory of the Department of Economics and Political Science. This laboratory has also rendered valuable service in preparing many of the statistical tables which appear in this report.





THE ALUMNI

The report of the Secretary of the General Alumni Association deals with the organization of the alumni, with the management of the *Alumni Weekly* which has a subscription list of 3,000, and with the statistics of graduation. From the founding of the University to August 31, 1912, the University has conferred degrees upon 9,654 graduates. It is estimated that of these 8,930 (6,700 men and 2,230 women) are now living. A little more than two-thirds (5,680) of the alumni are residents of the State of Minnesota. The remaining 3,250 are widely scattered, chiefly throughout the northwestern states. The interest of the alumni is attested in many ways. Alumni dinners and meetings of graduates have been held in many towns of the State to welcome the president and other members of the University staff. In connection with the University "Weeks," held in June (see page 163), the alumni of each community worked enthusiastically to make the experiment a success. The influence of the graduates of the University is an important asset of the institution. The co-operation of these men and women must be relied upon by those who are responsible for guiding the growth of the University. This co-operation to be permanently successful must take the form of diffusing widely through the State accurate facts and convincing arguments concerning the needs of the University and its value to the State. Any concerted movement at all resembling an organized lobby to exert pressure upon the Legislature would be rightly resented and would react seriously upon the institution. The alumni have shown their appreciation of this danger and may be counted upon to act with consideration for the larger welfare of the State and of the University as a servant of the commonwealth.

UNIVERSITY FUNCTIONS, CONVOCATIONS,
PUBLIC LECTURES, ETC.

The inauguration exercises.—The ceremonies connected with the inauguration of the third President took place in October, 1911. The alumni procession and pageant on the evening of October 17th were notably successful and impressive. The exercises of inauguration day were simple, appropriate, and

brief. The dinner at the University Farm in the evening was informal and spirited. The presence of a large number of the alumni lent to that occasion an enthusiasm which a smaller and more conventional function would have lacked. Delegates from 127 colleges, universities, and learned societies participated in the inauguration ceremonies, in which numbers of representative citizens and public officers of the State had a share. The committees of the Board of Regents, of the Faculties, and of the Alumni performed their duties with intelligence and efficiency.

Commencement exercises.—At the Commencement in June the Deans and a majority of the Faculty appeared in academic costume. This was officially adopted by the Faculties before the inauguration exercises in October of 1911. The arrangements for the routine of Commencement were modified to the extent that the students of each college were presented for their degrees by the Dean of that College. The candidates were conducted to the platform by a corps of University marshals chosen from the junior classes of the different colleges. The Commencement address was delivered by Dr. Albert Shaw, Editor of the *American Review of Reviews*, who spoke upon the subject, "Old Culture under New Tests." The Baccalaureate address was given by Professor Theodore G. Soares, Minnesota '91, of the University of Chicago. The Phi Beta Kappa orator was Dr. Talcott Williams, Dean of the School of Journalism, Columbia University.

Opening convocation.—The first day of the autumn semester, 1911, there was a general assembly of Faculty and students in the University Armory. The brief exercises succeeded admirably in emphasizing the unity of the institution as a whole, in recognizing the individuality of its various divisions (the students and teachers of each college were asked to rise as the roll of the colleges was called), and in deepening in all at the outset of a new year the sense of obligation to the State which makes the university opportunities possible. The opening convocation will be a permanent institution. At another convocation held in October, an address was delivered by the President of the United States.

Chapel assemblies.—The re-arranged schedule of classes provided for University chapel assemblies on Mondays, Wed-

nesdays, and Fridays. These gatherings were addressed by distinguished speakers from Minneapolis and St. Paul and from abroad. A number of musical programs were provided under the charge of the Director of Music. Among the non-resident speakers who gave addresses during the year were: Hon. Lawson Purdy, of New York; Mr. Raymond Robbins, of Chicago; Dr. Richard G. Moulton, of the University of Chicago; Dr. Woods Hutchinson, of New York; Professor F. J. E. Woodbridge, of Columbia University; Professor Joseph Jastrow, of the University of Wisconsin; Hon. Walter L. Fisher, Secretary of the Interior; Dr. Isaac J. Headland, of Pekin University; Professor Casper René Gregory, of Leipzig University; Professor W. Johanssen, of the University of Copenhagen; Professor Albert Bushnell Hart, of Harvard University; Dr. Inazo Nitobe, of Tokyo.

Courses of public lectures.—In furtherance of the policy of fostering the intellectual life of the University, public lecture courses and single lectures were arranged during both semesters. A valuable course in Comparative Literature was given by a group of professors of the University. Professor Otto Heller, of Washington University, delivered a course of five lectures on Ibsen; Professor E. A. Moore, of Harvard University, three lectures on Modern Thought and Religious Belief. Dr. Inazo Nitobe, of the First Higher College, Tokyo, Japan, Exchange Professor, gave a course of eight lectures on the History and Institutions of Japan. A series of vocational addresses on the chief careers open to college men and women was delivered by leading business men and social workers of Minneapolis and St. Paul. The University was fortunate in being able to secure so distinguished a corps of special lecturers, most of whom spoke without fee. Men and women of note are constantly passing through the two cities, so that it is always possible to secure acceptances from many speakers who confer distinction upon the University. It is hoped that funds will soon be available for paying, as other universities do, lecture fees to eminent scholars and to men and women in public life. It is one of the duties of an institution of higher education to bring its students and faculties into personal contact with leaders in the various fields of scholarship and service.

Meetings of societies.—The University offers its hospitality

to educational groups of many kinds. During the year the Superintendents of Schools of Minnesota held their annual meeting at the University.

Representation at other institutions.—A large university is called upon constantly to send representatives to the meetings of scientific societies and to public ceremonies of other universities and colleges. It has been the policy of the University to limit representation at these gatherings as strictly as possible by applying the test of increased efficiency for those who attend the meetings, and the possibility of contributing to the interests which are represented. In case of ceremonies which are largely formal, such as the inaugurations of new presidents, the University has asked alumni in the vicinity of the institutions concerned to represent Minnesota at these gatherings. In this way and by direct representation from the University staff, the University of Minnesota has participated in the following scientific meetings and university and college ceremonies: Kansas City Conservation Congress; Inauguration of Guy Potter Benton as President of the University of Vermont; Inauguration of Thomas Edward Hodges as President of the West Virginia University; Semi-Centennial Celebration of the University of Washington; Dedication of the Building of the Iliff School of Theology and installation of The Reverend Harris Franklin Hall as President; Celebration of the 125th Anniversary of the University of Pittsburgh; Centenary Celebration of the Academy of Natural Sciences; Inauguration of John Grier Hibben as President of Princeton University; Celebration of the 75th Anniversary of the Founding of the University of Michigan; First International Eugenics Congress, London, England; Bicentenary Festival, Medical School, Trinity College, Dublin, Ireland; Royal Society for the Promotion of the Natural Sciences, London, England.

A SURVEY OF THE COLLEGES

The extended reports of the Deans of the various divisions of the University form a part of this volume. In the following paragraphs are summarized the salient ideas which are presented in these different reports.

College of Science, Literature, and the Arts.—The Dean reports the re-organization of combined courses in Law, Medicine, and Education by means of which the curricula of these colleges are brought into close relation with the curriculum of the College of Science, Literature, and the Arts. Stress is laid upon the need of additions to the teaching force and upon the importance of larger salaries for men of unquestioned ability or of distinct promise. There is an enumeration also of the buildings which are desirable for the immediate use of the College or which should be included in a building program for the future.

College of Engineering and the Mechanic Arts.—The Dean reports the resumption of courses in Architecture and the inauguration of a five-year course in Engineering. The value of an urban location for engineering schools is demonstrated. A plea for the removal of the extra tuition fee for non-resident students is based upon the belief that the College of Engineering has a duty to the whole Northwest. Plans for an Engineering Reference Bureau for the State, a center for technical societies, a library, and for the co-operation of practicing engineers, are outlined. An academic year of eight months secured by the curtailing of vacation periods is recommended. A building for Electrical Engineering is urged as a pressing need of the College.

The Department of Agriculture.—This Department reports the organization of a Bureau of Research in Agricultural Economics for the study of marketing problems, credit for farmers, land titles, etc. This Bureau has recently made a social survey of a rural township in southern Minnesota. The extension activities of the Department are enumerated. These include industrial contests, farmers' clubs, demonstration farms, special educational trains, providing judges for County Fairs, thirty-five short courses in High Schools, supplying of lecturers for farmers' meetings, etc. The Department, through press sheets, plate service, and extension bulletins, distributes information throughout the State. The report includes also a plan for the organization of the Department and enumerates additions to the teaching staff. Curriculum changes, the raising of entrance requirements, the discontinuance of the two-year course in Home Economics, specialization in Junior and Senior years are set forth in detail.

The Dean calls attention to the establishment of a Department of Agricultural Education, a plan for segregating the staffs of the College, School, and Station, a proposed five-year course in the Schools of Agriculture, the success of the new Junior Short Course, and the establishment of a system of correspondence instruction for School students during the summer vacation. The report deals also with the development of Graduate Work in the College of Agriculture.

The work of the Experiment Station is described, and a list of special investigations under way is given. Plans for the new stations at Duluth and Waseca are outlined. Statistics of registration, special needs of the various departments, salary increases, increases in the staff, and the building requirements of the several divisions of the Department are set forth in detail. The report of the Dean includes statistical and other information concerning the stations and schools under the control of the Department in different parts of the State.

The Law School.—The Dean describes the changes in the entrance requirements, in methods of instruction, gives facts with regard to registration and geographical distribution, outlines the policy with reference to the teaching of Law at night, and indicates the general plans for future development.

College of Medicine and Surgery.—This report includes that of the Superintendent of Hospitals. Special attention is called to the clinical needs of the College and a plea is made for increased hospital facilities. The concentration of all the work of the College, including the out-patient service, is urged. The claims of preventive medicine and of public health are urged, and the establishment of courses for the training of health officers is recommended. The Hospital report gives in detail the facts about patients, operations, per capita costs, etc.

College of Dentistry.—The Dean describes the re-organization of the work of the College, the raising of standards, makes a plea for research work, maintains that preventive dentistry offers a most important field of development, presents arguments for the maintenance of a dental clinic through the summer, and shows the need of scholarships for promising students.

College of Pharmacy.—The Dean reports co-operation with the University Dispensary, and the success of the medicinal plant garden. He makes a plea for an increase in the teaching

staff of the College, for raising the standard of admission, and the development of a four-year course. He describes also the new quarters which are being prepared for the College.

School of Mines.—The Dean reports changes in the curricula, the adding of a course in Mine Plant Designing and points out a demand for experts in metallography. The work of the Experiment Station is described and statistical reports as to specimens assayed, etc., are included. The needs of the School are declared to be increases in staff, improved equipment, and, in the near future, more adequate buildings.

School of Chemistry.—The Dean reports statistics of registration, scholarship, etc., describes the various curricula of the School, indicates the special investigations which are being carried on, and appends a list of theses upon which students have been engaged.

College of Education.—The Dean makes a plea for better training for High School teachers, and for the technical preparation of principals, superintendents, and special teachers of vocational subjects. The needs of the College with respect to staff, co-operation with the other divisions of the University, equipment and buildings, are clearly set forth.

Graduate School.—In addition to important statistics, the Dean reports in general upon the status and policy of the graduate work in the University. He asserts that the University in many departments is not equipped for genuine graduate work. He emphasizes the need of more men for research, more leisure and more adequate compensation. He reports the raising of the standard of graduate work by abolishing work *in absentia*, and discusses the character and purpose of the course leading to the Master's degree. The influence of the Graduate School on the University as a whole is insisted upon.

Report of the Dean of Women.—This report deals with the supervision of lodging-houses, with employment for women, with scholarships for women, with the Student Government Association and Shevlin Hall, with the sororities, the Pan-Hellenic Association, and other student activities. The Dean recommends that the Dean of Women be made a member of the student work committees in all colleges which enroll women. She advises the continuance of lectures in personal hygiene and reports a plan for the re-organization of health supervision

and physical education for women. The report includes the recommendation of more dormitory room and makes a plea for co-operation in raising standards of taste and conduct.

Report of the Librarian.—This report outlines the library policy, proposes a plan for determining relations between the general library and the departmental libraries, describes the cataloguing work in progress, proposes the establishment of a loan department, warns against the danger from fire, offers a program of library development and recommends increases in the staff and the early beginning of a new Library Building.

THE UNIVERSITY AND THE STATE

If the University is to realize the ideal of "a campus as wide as the Commonwealth," it must know the natural resources, the people, the institutions, the needs of the whole State. Much of this knowledge can be acquired only as men from the University mingle with their fellow citizens in the cities, towns, and country-sides. With a view to understanding more intelligently the life of Minnesota, the President of the University has, since assuming office in the spring of 1911, visited more than sixty counties of the State. The traveling representatives of the Department of Agriculture have reached every part of the Commonwealth. Individual members of the University teaching staff have addressed audiences throughout Minnesota. Experts of the Geological Survey have been at work in the field examining certain economic resources. The staff of the Botanical Survey have been making their investigations. A special social and economic survey of a Minnesota township was carried on during July and August. Representatives of the School of Mines have estimated ore deposits for the State Tax Commission. An economic specialist of the University has conducted special investigations for this same body. The appended reports of the University Extension Division, the Geological Survey, the Botanical Survey, give the details of the work which is being done by the University "on the larger Campus."

It may be well to summarize briefly the different types of service which the University is rendering to the State of Minnesota.

General education.—Hundreds of young men and young women are receiving every year a general higher education which aims to foster intelligence, efficiency, and loyalty to the common life. These students ought not to be regarded as merely fitting themselves for personal success. They are by virtue of their education an asset to the State. It is the business of the University to impress upon them this social obligation.

Professional training.—In its technical schools the University maintains a high standard of preparation for lawyers, physicians, engineers (civil, mechanical, electrical, and mining), expert farmers, teachers, pharmacists, dentists, and chemists. Again it must be said that this professional training affords more than an equivalent to the State through dissemination of specialized skill which is put at the service of the community.

Research.—The specialists of the University in library, laboratory, and the field are constantly engaged in seeking new facts which shall be either of immediate practical value or shall increase man's intelligent understanding of the world in which he lives. Modern Germany has demonstrated convincingly the value of research in application to every phase of the national life.

Farm schools.—At St. Anthony Park, Crookston, and Morris, hundreds of boys and girls are, under University auspices, given a thorough course in preparation for farm life. Evidences of the influence of these schools are to be found in every part of the State in improved methods of farming, in a co-operative spirit, in ambition to make country life interesting and rewarding.

Botanical and Natural History Survey.—The University for years has made a study of the plant and animal life of Minnesota with important practical and scientific results.

Geological Survey.—The institution's experts study the natural resources of the State, the deposits of ores, peat, stone, clay, and other minerals. The results are published in official bulletins.

Publishing new knowledge.—By means of publications, articles, and bulletins the University is steadily communicating to the public the results of its search for new ways of dealing with the problems of men's daily lives.

Sending out graduates.—The University has conferred degrees during the last forty years upon nearly nine thousand men and women, two-thirds of whom are living in the State of Minnesota and contributing their knowledge and training to hundreds of communities in the Commonwealth.

Distributing farm facts.—Through the publication of extension bulletins on a great variety of farm problems well-tested information is being distributed to thousands of farmers throughout the State. One has only to send name and address to the University Farm, St. Paul, to receive these bulletins regularly.

Short courses.—Through the Extension Division short courses on the problems of farming and country life are carried on in towns and villages throughout the State, while at the University Farms hundreds

of students are enrolled each year in brief courses in dairying, animal husbandry, traction engineering, etc.

Demonstration farms.—Twenty privately owned farms are operated under the direction of the College of Agriculture with a view to demonstrating in as many communities that better systems of farm management are applicable to farm conditions, and that, when practiced, greater profits are secured.

County agents.—In several counties the University, co-operating with the U. S. Department of Agriculture and the citizens of the counties, maintains agents who are at the service of farmers. These agents give advice on crops, stock, drainage, and numerous other farm topics.

Demonstration trains.—From time to time, in co-operation with the railway companies of the State, the University sends out especially equipped trains with exhibits, live stock, etc. Such trains make stops in scores of communities where the lecturers give lectures and demonstrations and distribute literature.

Industrial contests.—An interest in farm life is aroused in the rural schools by prize competitions. At present 1,300 boys are interested in the corn acre-yield contest, and 15,000 boys and girls are working for prizes in sewing, baking, grain, fruit, and vegetable raising.

County Fair judging.—The University provides judges for determining the prizes awarded at a score of County Fairs.

Night classes.—Regular courses for credit are offered in St. Paul and Minneapolis in English, Foreign Languages, Mathematics, Law, History, Mechanical Drawing, and other subjects.

Lecture courses.—The University is prepared to provide lecture courses in all parts of the State at a minimum price for lectures and expenses. In some subjects lectures may be secured without charge.

Correspondence teaching.—Courses in Education, Economics and Political Science are now provided by correspondence. It is hoped in the early future to add important vocational and other courses to this list.

University Weeks.—Last June the University conducted courses of lectures and entertainments in eighteen towns of Minnesota and reached directly twenty thousand people with suggestions on various community and personal interests, farming, business, public health, art, literature, education, child welfare, and other vital topics.

Free hospitals and clinics.—The University maintains a hospital with 120 beds, and a dispensary or out-patient department. Only patients who are unable to meet the usual expenses of sickness are admitted to the Hospital or treated at the Dispensary. In admitting to the Hospital, preference is given to citizens from outside of St. Paul and Minneapolis.

Expert service.—The specialists of the University staff are constantly serving the State in many ways. Thus the mining experts report to the State Tax Commission the value of ore deposits on the northern ranges. Another professor prepares statistics upon which the Commission bases much of its work. There is close co-operation between the University and the State Board of Health.

Rural survey.—With a view to gathering accurate information about

country life, the University has begun to study in detail certain selected townships in the State. The published results ought to be of value.

Rural co-operation.—A bureau of the University is making a specialty of the problem of marketing farm products and the various ways by which farmers may work together for their mutual advantage.

Answering questions by mail.—Thousands of letters which raise a great variety of questions are every year answered by the different departments of the University. Such correspondence is welcomed.

PHYSICAL PLANT AND EQUIPMENT

The Library.—A large, well-selected, steadily growing, properly housed library is the very center of a true university. The subdivision of human knowledge is so minute, the accumulation of books so great, and scientific publication so voluminous that a large staff is needed to select, classify, and catalogue these resources. The present is so dependent on the past that thousands of volumes, series of periodicals, source materials of many kinds must be available if really advanced instruction, to say nothing of investigation, is to be carried on. The report of the Librarian (page 178) sets forth clearly the needs of the Library, and gives a table which shows that, judged by the number of volumes in its library, the University of Minnesota has much ground to gain before in this respect it can enter the first class of educational centers. The Public Library of Minneapolis and the State Historical Society Library in the Capitol must be reckoned as important contributing agencies in making books available for University students.

Books and apparatus.—The \$25,000 a year available for the purchase of books and apparatus has been economically expended and has increased the efficiency of all departments of the University. The actual needs, however, are far from met. Many of the scientific departments can not do effective work especially in research unless the funds available for the purchase of apparatus are considerably increased.

University architecture.—The new type of building adopted by the University is simple, dignified, and appropriate for a state institution. The lighting is exceptionally good and increases materially the educational efficiency of laboratories, lecture and class rooms. The construction throughout is fire-proof, and, while ornamentation and decoration have been reduced to a

minimum, there has been none of the false economy which effects an initial saving at the expense of ultimate cost for repairs and renewals. The type that is now established will be followed, with individual variations, in all of the new buildings of the institution. The halls and laboratories which face the main Plaza on the new campus will of necessity receive more monumental treatment, but even the façades of these buildings will not give the effect of extravagant ornamentation.

New buildings.—In September, 1911, the Elliot Memorial Hospital Building was opened to the public. In August, 1912, the New Main Building and the Experimental Laboratory of the College of Engineering and Mechanic Arts were occupied. The New Millard Hall and the Institute of Anatomy were also practically finished in August of 1912 and were being equipped for use for the next academic year. Work upon the Central Heating Plant is progressing rapidly and it is expected that steam from the new boilers will be turned on early in January, 1913. The new Mechanic Arts Building with Shops for the Department of Agriculture is well under way and will be ready for use in the spring of 1913. The additions to the dormitory and dining-hall accommodations for the Central School of Agriculture were completed and occupied during the year. All the new buildings for the Sub-Stations and Schools were either available during the year or were rapidly approaching completion. Various minor additions, barns, etc., authorized by the last Legislature have been put in service.

Delay in building the Chemistry Laboratory.—The Legislature of 1911 provided a total of \$405,000 for a new Chemical Laboratory. In the summer of 1911 the Dean of the School of Chemistry visited the chief chemical laboratories of Europe and of the United States with a view to securing the latest information. Through miscalculation in the original estimates, the appropriation was found inadequate to build the Laboratory which the School desired. Plans were repeatedly drawn and re-drawn with the hope that the original scheme might be at least approximated. When at the end of February, 1912, old Millard Hall was burned, the experts reported that the building could not be re-constructed. It was then proposed that the fire insurance from this Hall be added to the remodeling appropriations, that the Chemistry Laboratory be built on the enlarged

scale, and that the College of Dentistry be quartered in this building for the next few years. It was planned to ask, at the special session of the Legislature in June, for authority to make this transfer of funds. When the Legislature decided to consider only the measures included in the call of the Governor, this idea was abandoned. The Governor, the Attorney General, and the State Auditor were asked under the authority of an act giving them power to make appropriations in emergencies, to authorize the transfer of the fire insurance money and the special remodeling appropriation to the Board of Control for the completion of the Chemistry Building. These officials, however, deemed the situation not an emergency within the meaning of the act. Therefore, in the summer, it was necessary to go back to the original appropriation and to begin again an attempt to use the money in the most effective way. It is expected that the contracts for the building will be let sometime in January, 1913. The Regents will make no request for an additional appropriation for this building, but will do the best that can be done within the limits of the funds available.

Remodeling of old buildings.—In February, 1912, old Millard Hall, occupied by the College of Dentistry and in part by the College of Medicine and Surgery, was so seriously damaged by fire that at first the architects deemed it unwise to attempt the fire-proofing which had been authorized by the Legislature of 1911. After further consideration, the experts decided that the condition of the exterior walls justified the remodeling and the continued use of the structure. It is expected that this will be ready for occupancy by the Department of Pharmacy in the spring of 1913. The old Anatomy Building, adjacent to Millard Hall, will be rebuilt as a medicinal plant house. As soon as the Medical Science Building was vacated by the College of Medicine and Surgery in the early summer, the work of remodeling this building for the use of the College of Dentistry was pushed vigorously. At the end of August it was clear that the work would be completed in time for the opening of the new University year. When the Pharmacy Department has been transferred to its new quarters, the College of Dentistry will be admirably housed and equipped. The new operating clinic will be supplied with 125 chairs. The equipment of laboratories, shops, and operating rooms will be of the most modern type.

Heat and light.—The new Central Heating Plant on the river bank will be connected with all buildings through main and lateral tunnels and shafts cut in the sandstone which underlies the campus. The new plant, equipped with six boilers of 350 horse-power, will easily supply with steam all the present buildings and the new Chemical Laboratory, for which the contracts will soon be let. There will be a margin of capacity for the heating of still other buildings. The power house has been so constructed that new boilers may be added as the growing demands of the institution may require. One of the advantages of the new plant will be the elimination of the smoke which heretofore has come in such volume from the University stacks. The institution hopes to set an example of good engineering, of economical operation, and of regard for the community. Pending the development of the high-dam project it has been deemed unwise to recommend at present the installing of machinery for producing current from the exhaust steam of the heating plant. A contract, terminable on reasonable notice, has therefore been entered into with the Minneapolis General Electric Company for the supplying of current to supplement that which is generated in the old power house of the College of Engineering and Mechanic Arts. A comprehensive lighting plan will have to be worked out for the future. The University can not afford long to continue to purchase light and power on the present terms.

Grounds, maintenance, etc.—The large amount of building under way on the new campus has made it impossible to do any grading except in the vicinity of the Elliot Memorial Hospital. A number of years must elapse before this part of the University grounds can be made to assume its proper appearance. It is to be hoped, however, that the more unsightly features of this section can be removed, large areas graded, and the beginning of orderliness created. An arrangement with the city by which Pleasant Street is to be macadamized will bring about a long-needed improvement. When this work is completed, all the avenues on the old campus will be well surfaced. Plans are under way for using the surplus earth from the new campus to raise the level of the parade ground. The present grade is so low that it is impossible to keep this area covered with turf.

FINANCES

The University living within its income.—The Regents have adopted the policy of keeping the expenditures of the institution rigidly within the resources made available by the Legislature and by fees, etc. The rapid and unexpected growth of the institution in its early years often left no alternative between doing injustice to students and overrunning somewhat the income available. With the establishment of more stable and predictable conditions it is now expected that the University will soon be in a position where the policy of living within its income will be compatible with educational efficiency. In any event this policy will be maintained.

The budget system.—The Comptroller's report describes the budget system, by means of which the expenditures of the University are kept carefully within the limits decided upon at the outset of the fiscal year. The University budget is based upon these principles: 1, a conservative estimate of receipts; 2, a generous estimate of expenditures which must show 3, a safe margin of unassigned reserve; 4, the assigning, to each college and department of the University, of a specified sum for salaries, wages, equipment, supplies, etc; 5, a requisition system by which no expenditure can be made until the Comptroller has certified that the funds are available and the Budget Committee or the Executive Committee or Board have approved the expenditure; 6, the scrutiny month by month of the balances in the various budget accounts in order that the administration may know that the limits of the budget are not being exceeded.

A surplus for the year.—This budget system went into effect with the beginning of the year 1911-12. A number of uncertain factors made a policy of conservatism necessary. The amount of outstanding obligations was unknown and a reserve to meet these had to be kept in hand. Estimates of receipts were reduced to a point of complete safety. In some instances the actual income considerably exceeded these original estimates. Departments were urged to purchase cautiously in order to serve a margin for emergencies. As a consequence there was actually at the end of the year in addition to the regular budget reserve a considerable surplus. It should be remembered, however, that this was accomplished only at a sacrifice of educational

efficiency. Additional instructors were sorely needed, more adequate equipment and supplies should have been purchased, but all these needs were subordinated to the policy of business-like administration. In the light of a year's experience with the new system it will be possible to plan more closely and to reduce somewhat the annual surplus. The time will never come, however, when it will not be necessary to carry over from year to year a reasonable reserve as a protection against unexpected and unpredictable demands.

Changes in the scale of tuition fees.—On the recommendation of the Deans the Regents adopted the following scale of tuition fees, to take effect with the academic year, beginning August 1, 1912:

SCHEDULE OF STUDENT FEES

DIVISION	RESIDENT	NON-RESIDENT
College of Science, Literature, and the Arts.....	\$ 30.00	\$ 60.00
College of Engineering and the Mechanic Arts.....	50.00	50.00
College of Agriculture.....	30.00	60.00
Law School.....	65.00	65.00
College of Medicine and Surgery.....	150.00	150.00
College of Dentistry.....	150.00	150.00
College of Pharmacy:		
Two-year course.....	82.50	82.50
Three-year course.....	55.00	55.00
School of Mines.....	55.00	55.00
School of Chemistry.....	55.00	55.00
College of Education.....	30.00	60.00
The Graduate School.....	30.00	30.00

The effect of these fees is slightly to increase the revenue from the body of students as a whole. All laboratory fees which heretofore have been listed as separate items are merged in inclusive fees. The double fees to non-residents have been dropped in the case of the College of Engineering and the School of Mines and the School of Chemistry. In most cases these fees are higher than those which prevail in the leading state institutions of the middle west. It is a question whether in the attempt to secure additional revenue the principle of free higher education has not been overlooked. If so considerable an amount is to be levied upon students who attend the University, a serious question arises: "Are higher educational opportunities to be in any sense limited to the economically strong?" Much is to be said for a system by which fees are to be charged and then free scholarships provided for students who need assistance and who show that they deserve it. In the professional schools

especially, the relatively high fees ought to receive careful consideration. Here there is real need for free scholarships. Those who believe in higher education, can render no more valuable service than by co-operating with the State in endowing scholarships for promising but needy students.

Economy and efficiency.—The Comptroller calls attention in his report to delays in the payment of bills, delays which prevent the University from securing the best prices and the advantage of cash discounts. He points out also that by providing a central storehouse the University could centralize a good many purchases which are now made in small lots but under another system might be aggregated into orders for large quantities. While marked progress has been made in securing business efficiency, there are many ways in which the business department will be able to effect further economies. Inquiries are being set on foot to determine how economically the buildings of the University are being used. Obviously all the available space should be in service for the maximum length of time each day or week. Another field for investigation is the duplication of equipment, machine shops, and various types of apparatus. It is not believed that up to the present time such duplication has taken place in any wasteful way, but a careful inquiry will be instituted and certain principles will be laid down. Responsibility for the large amount of valuable apparatus and equipment owned by the University has been fixed upon an officer in the Comptroller's Department. It is the business of this person to visit the various departments and to check up periodically the apparatus, supplies, etc., which appear in the official inventories. It is possible to push the likeness between an educational institution and a large business too far, but there is also danger that the University may overlook a good many of the methods by which ordinary business houses effect economies and increase their efficiency. It is the aim of the University of Minnesota to conduct its affairs in a business-like, economical way at the same time that it safeguards the educational opportunities for which it was founded and exists.

Records of University land.—The University has never had in its own possession a complete record of its own lands. During the last few months a man has been employed to make such a record. He has discovered that a considerable number of acres

due the University have not been designated. Steps will be taken to rectify this error. This whole work when completed will provide an authoritative and accurate list of all lands which belong to the institution.

SUMMARY

In conclusion, the essential principles of University growth are briefly summarized.

Men make a University.—This principle needs to be kept steadily in mind. Equipment and housing are important only in relation to the men who use the equipment and occupy the buildings. It is the duty of the University to recognize and encourage its strongest investigators and teachers, and to add to their number. Funds are needed, therefore, for increases of salaries and for enlargement of the staff.

Encouragement of research.—A true University can exist only where a group of investigators in the chief departments of Arts and Sciences are at work on the frontiers of knowledge. The University of Minnesota can not expect suddenly to create a Graduate School. Graduate work, to be sound, must be developed gradually. Men overwhelmed with routine must be freed for investigation. Departments already promising must be strengthened. The graduate work of other neighboring institutions must be taken into account. This University should seek to fit itself into the higher educational situation of the Northwest. Graduate work is so expensive that duplication ought, so far as possible, to be avoided. A Graduate School is created, not by bribing students to attend, but by offering work of a high character under well-trained men of outstanding ability and inspiring leadership.

The training of teachers.—It is the duty of the University to prepare teachers for the High Schools of the State, to train principals and superintendents and teachers of vocational subjects. It is coming to be more clearly recognized that the mere possession of knowledge, however authoritative and accurate, does not in itself prepare one for teaching. It is obvious that teaching and supervision have become technical professions which require special training. Through its College of Education, in co-operation with all the divisions of the Uni-

versity, the institution aims to provide effective training. A University practice high school is a necessary part of any plan for the thorough professional preparation of high school teachers and principals. The College of Education needs an adequate staff and suitable quarters, both for its own classes and for its practice school.

University Extension.—In fulfillment of its obligations to the State, the University must not only give training to those who resort to its teaching centers, but it must go to the people in their communities and their homes. This service can no longer be regarded as merely incidental, as a kind of by-product of the main activity of the institution. A special staff is needed for the general extension work of the University, just as such a corps is engaged for Agricultural Extension. Among the many forms which this extension movement may profitably take are: evening classes in large urban centers and towns, technical classes for artisans, shop men, and professional workers, courses of popular lectures, single addresses, organized series of exercises such as University Weeks and winter short courses, correspondence instruction supplemented by periodic visits of traveling supervisors, debating societies, so-called lyceum courses of lectures, concerts and entertainments, organized circuits of local dramatic clubs under the direction of traveling professional coaches, similar circuits for choral societies, co-operation with local civic associations in the activities which are commonly identified with the "Social Center" movement, a lantern slide and moving-picture film service for schools and other centers, local campaigns for medical supervision of schools, public health, personal hygiene, and many other plans for disseminating information, suggestions, and ideals. The University should seek the co-operation of all the agencies in the State that are engaged in educational work, and with them develop a plan by which duplication and friction may be wholly eliminated.

The University and the State educational system.—The University does not arrogate to itself the control of the educational system, but must take an intelligent and genuine interest in every division of the system. Through its College of Education the institution may render important service in studying the problems of the grade schools, the curriculum, organiza-

tion, and administration. The University is immediately interested in the efficiency of the High Schools. It would have them not so much preparatory schools for the college as institutions serving the communities in which they are established and the majority of pupils whose formal education is carried no further than high school graduation. The University can not do its duty by the High Schools until plans are perfected by which University teachers can visit these schools regularly, familiarize themselves with the problems of adjustment and instruction and thus become more intelligent and sympathetic with reference to the situation. The present condition of isolation can not be allowed to continue. The University is concerned also with the institutions for special classes of children, youth, and adults. These agencies are of interest from scientific, sociological, and educational points of view. The University should seek to co-operate with all these institutions and to serve them in every possible way.

The University and the State government.—The University is “out of politics” in the narrower, partisan sense, but it has a part to play in the wider meaning of politics, the efficient conduct of public affairs. A line should be drawn between administration, the exercise of police-power, etc., on the one hand and on the other the supplying of the exact information and tested experience upon which good administration must be based. With the first function the University has no direct concern. It would be disastrous for the institution to seek to enter this field. But the various departments of State administration should look to the University for the accurate data and the expert knowledge which they need. This service is already being rendered to two or three departments. This policy is capable of large expansion. The University is ambitious to be the unbiased, non-partisan source of scientific knowledge for the administrative boards and officers of the State.

University individuality.—Every institution should seek not only to conform to the best educational standards which prevail throughout the country, but should also aim at fostering an individuality of its own. The University of Minnesota should seek to stand for something definite and different. For example, there is every reason why the University should seek to become the chief center of Scandinavian studies in the United States.

Here should be collections, museums, libraries, and a staff of investigators and teachers which would give distinction to the University. Exchange professorships with the Universities of Norway, Sweden, and Denmark should be arranged. It should be a conscious purpose of the institution to discover its special aptitudes, sources of strength, opportunities for service, and of these to make the most.

Sense of service to the State.—Back of all the University's activities, giving significance and purpose to them, should be a deepening sense of obligation on the part of students and staff conscientiously to utilize the opportunities afforded by the Commonwealth in order to make the largest return of skill, intelligence, and efficiency.

Respectfully submitted,

GEORGE E. VINCENT, *President*

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

To the President of the University:

SIR: I submit herewith my report of the College of Science, Literature, and the Arts for the year ending July 31, 1912, together with some recommendations, preceding the report by a brief account of the origin and growth of this College.

Origin and growth.—The College of Science, Literature, and the Arts had its real beginning in 1869, when the first freshman class was registered, though there had been in operation for a few years before this date a preparatory department, supported by University funds and under the direction of the Board of Regents. The Faculty of this opening year consisted of the President, seven other professors, and one tutor, all of whom gave instruction in preparatory, as well as college, subjects.

Faculty and students in different years.—Table I shows the number of faculty members of the respective ranks and the number of students in the college in the different years from 1871-2, the year of the first junior class, to the present.

Registration by counties.—The registration for the past year by counties in Minnesota was as follows: Aitkin, 2; Anoka, 7; Becker, 5; Beltrami, 3; Benton, 2; Bigstone, 7; Blue Earth, 9; Brown, 15; Carlton, 5; Carver, 6; Cass, 0; Chippewa, 2; Chisago, 9; Clay, 3; Clearwater, 0; Cook, 1; Cottonwood, 1; Crow Wing, 11; Dakota, 12; Dodge, 4; Douglas, 6; Faribault, 5; Fillmore, 3; Freeborn, 6; Goodhue, 18; Grant, 5; Hennepin, 879; Houston, 9; Hubbard, 3; Isanti, 0; Itasca, 9; Jackson, 4; Kanabec, 6; Kandiyohi, 3; Kittson, 2; Koochiching, 1; Lac qui Parle, 6; Lake, 5; Le Sueur, 7; Lincoln, 4; Lyon, 7; McLeod, 16; Mahnomen, 0; Marshall, 1; Martin, 6; Meeker, 8; Millelacs, 9; Morrison, 6; Mower, 7; Murray, 2; Nicollet, 2; Nobles, 5; Norman, 1; Olmsted, 16; Ottertail, 12; Pennington, 5; Pine, 3; Pipestone, 5; Polk, 10; Pope, 1; Ramsey, 208; Red Lake, 0; Redwood, 2; Renville, 10; Rice, 12; Rock, 5; Roseau, 2; Saint Louis, 46; Scott, 6; Sherburne, 3; Sibley, 3; Stearns, 10; Steele, 8; Stevens, 1; Swift, 6; Todd, 2; Traverse, 4; Wabasha, 5; Wadena, 1; Waseca, 5; Washington, 22; Watonwan, 2; Wilkin, 1; Winona, 5; Wright, 16; Yellow Medicine, 8.

Registration by states and countries.—The registration for the past year by states and countries was as follows: Minnesota, 1,602; Canada, 2; Idaho, 1; Illinois, 4; Indiana, 1; Iowa, 45; Japan, 2; Montana, 5; Nebraska, 6; New York, 1; North Dakota, 35; Oregon, 3; South Dakota, 22; Wisconsin, 34; Alaska, 1; Missouri, 1; Washington, 1. Total number from without Minnesota, 164.

TABLE I. NUMBER OF FACULTY MEMBERS AND STUDENTS FOR EACH YEAR, 1871 to 1912

YEAR	PROFESSORS	ASSOC. PROFESSORS	ASS'T PROFESSORS	INSTRUCTORS	TOTAL FACULTY	STUDENTS
1871-72	8	0	0	0	8	27
1872-73	9	0	1	2	12	44
1873-74	8	0	1	2	11	71
1874-75	10	0	2	1	11	83
1875-76	9	0	1	1	11	143
1876-77	10	0	0	5	15	159
1877-78	10	0	0	5	15	180
1878-79	11	0	1	4	16	189
1879-80	9	0	0	4	13	196
1880-81	10	0	3	1	15	214
1881-82	13	0	2	2	17	163
1882-83	13	0	2	3	18	145
1883-84	10	0	2	3	15	147
1884-85	14	0	2	5	21	163
1885-86	14	0	3	4	21	180
1886-87	14	1	1	6	22	223
1887-88	15	1	1	6	23	282
1888-89	17	1	0	5	23	342
1889-90	17	1	4	4	26	434
1890-91	17	1	4	4	26	519
1891-92	18	1	4	10	33	537
1892-93	17	1	4	11	33	631
1893-94	19	1	6	19	45	679
1894-95	19	1	6	16	42	722
1895-96	20	1	10	16	47	819
1896-97	21	0	10	25	56	909
1897-98	22	0	13	30	65	940
1898-99	24	0	14	22	60	907
1899-00	23	0	13	31	67	941
1900-01	25	1	14	34	74	1093
1901-02	26	1	13	32	72	1179
1902-03	25	1	15	41	82	1215
1903-04	26	1	20	30	77	1252
1904-05	29	1	19	32	81	1249
1905-06	30	2	23	34	89	1362
1906-07	30	2	23	34	89	1418
1907-08	37	2	31	27	97	1484
1908-09	36	0	32	25	93	1494
1909-10	43	0	32	30	105	1567
1910-11	44	0	40	39	123	1542
1911-12	44	0	40	48	132	1758

First Dean.—The first Dean of the College was appointed in 1903, the President of the University having previously performed the duties of that office. The first Dean of Women was appointed in 1907.

Curriculum changes.—The curriculum has undergone many changes. In the earlier years there were, as in other institutions of higher learning, different courses leading to different degrees, with practically all of the subjects prescribed. More and more subjects were introduced, with many privileges of choice on the part of students, until the courses became largely elective, leading to but one degree, viz., Bachelor of Arts. At present the elections are restricted by the requirement that there be one major course, consisting of three years in one department, and three minor courses, consisting of two years in each of three departments, and a few less important requirements.

Pre-professional courses.—As our Colleges of Law, Medicine and Surgery, and Education require for admission two years of work in the College of Science, Literature, and the Arts, many students enter for the

first two years only, imposing the necessity for a large teaching force for the subjects of these two years.

Distribution of major subjects.—The major subjects selected by the last graduating class were distributed among the various departments as follows: Animal Biology, 16; Botany, 15; Chemistry, 22; Economics and Political Science, 75; Education, 1; English, 111; Geology and Mineralogy, 4; German, 82; Greek, 5; History, 49; Latin, 20; Mathematics, 31; Philosophy and Psychology, 11; Rhetoric and Public Speaking, 28; Romance Languages, 18; Scandinavian, 4; Sociology and Anthropology, 9.

Grades received in year 1911-12.—The grades received for subjects pursued during the past year are as follows: Excellent, 4,228; good, 7,863; pass, 5,534; condition, 1,228; failure, 1,065.

The following figures indicate for the first semester the average number of students in the care of each teacher of the College and the percentage to which he assigned the different gradings of the marking system:

AVERAGE NUMBER OF STUDENTS	% E	% G	% P	% C	% F
77.5	21.1	38.7	24.5	5.5	5.2

"Incompletes" are not included in this table. These may be safely divided between "passes" and "goods." The percentages vary with individual instructors and with the character of the course (elementary or advanced, required or elective). The percentage of excellents ranges from 0 to 72, of failures from 0 to 21.

Needs for additional buildings.—The 1,758 students registered in this College do not represent nearly all of the students taught by members of the Faculty of this College. Students in large numbers from the College of Engineering, the College of Agriculture, the School of Mines, the School of Chemistry, the College of Education, the College of Pharmacy, and the Graduate School are taught in various branches by members of this Faculty. Students registered in our own College and those registered in other colleges but taking part of their work in this College have been coming in ever-increasing numbers, until we are now greatly in need of additional buildings; indeed, some departments, notably the scientific departments, are greatly hampered in their work for want of room and suitable equipment.

Biology Building.—The greatest need, and it is an imperative need, is for a Biology Building, for the departments of Animal Biology and Botany. The removal of these departments from Pillsbury Hall would permit the expansion of the Department of Geology and Mineralogy, which is now greatly cramped for room and handicapped in its work. Any one of these three departments is now much larger than were all three of them when the building was erected for their accommodation.

The demands are for a large building, the basement to contain aquaria and living animals; the first and second floors to contain classrooms, laboratories, herbarium room, library, seminars, offices, etc.; and the third floor to contain a large museum, work rooms, and store rooms.

The equipment for such a building is expensive, and for building and equipment the appropriation should be not less than \$400,000.

There should be an additional appropriation for the remodeling of Pillsbury Hall for suitable accommodation of the Department of Geology and Mineralogy.

Remodeling the old Chemistry Building.—Folwell Hall is now greatly overcrowded. This is partly due to the growth of the departments for whose accommodation it was built, and partly due to the temporary housing here of the College of Education, the Department of Sociology and Anthropology, the Department of English, and the student publications. When those having temporary quarters in this building are provided for in other buildings, the remaining departments can expand into the rooms vacated. The present Chemistry Building, properly remodeled, would provide suitable quarters for the College of Education, and perhaps some department of the College of Science, Literature, and the Arts, and the removal of these from Folwell Hall would enable the remaining departments to expand into the rooms vacated. The future use of this building should be determined, the architect should determine the cost of remodeling, and the Regents should ask for the appropriation found necessary for remodeling and equipping.

Other buildings.—Other buildings that should be provided in the near future for this College alone or in which this College will have a part, are the following: 1. Chapel and Assembly Hall; 2. Library Building; 3. Administration Building; 4. Men's Dormitories; 5. Men's Union Building; 6. Women's Gymnasium; 7. Additional Women's Dormitories.

Additions to teaching force needed.—When it is remembered that, in addition to the 1,758 students registered in this College, large numbers of students registered in other schools and colleges of the University take part of their work in this College, it is seen that the 132 professors, assistant professors, and instructors do not constitute a sufficiently large teaching force. Many of our sections are too large to permit the best results and many of the faculty members diminish their efficiency by teaching too many sections. There should be additions to the teaching staff of nearly every department in the College.

Larger salaries needed.—I can not too strongly urge that the Board of Regents follow up the resolution adopted at the meeting of June 10, 1910, recognizing "the need of increased salaries and the further need of adopting a definite schedule of salaries." When vacancies now occur, it is very difficult to fill them with suitable men on account of the low salaries paid. We can not compete with the institutions with which we are accustomed to compare our University, and too often they get the men we would like to have, forcing us to take less desirable men, and occasionally good men of our Faculty are enticed to other institutions by the larger salaries paid. It is most important that the Board of Regents adopt, before making up its budget of appropriations to be asked from the Legislature, a scale of salaries and increases similar to that

COLLEGE OF ENGINEERING AND THE MECHANIC ARTS

To the President of the University:

SIR: I have the honor to submit a report for the year 1911-12.

The growth of the College.—The College of Engineering and the Mechanic Arts was organized under the Legislative Act of 1868, and the modification of 1872. Courses in Civil and Mechanical Engineering were offered in 1871. The first two years for engineers were taken in the Scientific Course of the Collegiate Department of the University, so that no students existed in the College of Mechanic Arts until 1873. In 1875 three men were graduated. The more adequate existence of the College as a technical school dates from the coming, in 1880, of Mr. William A. Pike as Professor of Engineering. In 1886 he was made Director, and in this year the completion of the Mechanic Arts Building gave quarters which permitted some expansion in laboratory, drawing, and shop work. This year marks also the assumption of the full four years of Engineering work by the College, and the beginning of growth in numbers of students. Prior to the year 1886 but eighteen men had received degrees in Engineering or Architecture. A course in Electrical Engineering was established in 1887, and in 1891 the School of Mines was instituted and became part of the College of Engineering, Metallurgy, and the Mechanic Arts. In 1896 the School of Mines was detached, and the College received its present name, the College of Engineering and the Mechanic Arts. In 1890 William A. Pike, Director and Professor of Civil Engineering, was made Dean of the College. He was succeeded in 1892 by Professor Christopher W. Hall, Professor of Geology, who resigned the deanship in 1897 to be succeeded by Frederick S. Jones, Professor of Physics, in 1902; who in turn was succeeded in 1909 by the present Dean, Francis C. Shenehon, a Civil Engineer. The Mechanical and Electrical Departments were housed in separate buildings of cheap construction in 1901. In September, 1911, the new Experimental Engineering Building, and in August, 1912, the new Main Engineering Building, were occupied; and the Mechanic Arts Building was abandoned for utilization by the College of Science, Literature, and the Arts and for general University purposes. Since 1881 the growth in the instructional staff has been marked and the history of the College has been determined by the men who formed part of that staff. The brevity of this statement bars names in detail. Some losses have come to the College and retirements in the past year have removed from active work Professors Arthur E. Haynes and Henry T. Eddy, long identified with the substantial scholarship and growth of the College.

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Registration statistics.—Table I gives the annual registrations of the College of Engineering from its beginning to the session of 1911-12. Table II gives the number of conditions and failures received by students in the College during the session 1911-12.

TABLE I. REGISTRATION IN THE COLLEGE, 1873-1912

YEAR	No.	YEAR	No.	YEAR	No.
1873-74	4	1886-87	15	1899-1900	195
1874-75	7	1887-88	28	1900-01	246
1875-76	4	1888-89	25	1901-02	312
1876-77	3	1889-90	33	1902-03	371
1877-78	5	1890-91	74	1903-04	395
1878-79	3	1891-92	78	1904-05	399
1879-80	2	1892-93	154	1905-06	412
1880-81	2	1893-94	147	1906-07	458
1881-82	9	1894-95	149	1907-08	473
1882-83	15	1895-96	201	1908-09	467
1883-84	8	1896-97	186	1909-10	407
1884-85	7	1897-98*	129	1910-11	420
1885-86	none	1898-99	143	1911-12	378

Total.....6,364

*Prior to 1897-98 students in Mining and Chemistry are included.

TABLE II. SCHOLARSHIP STATISTICS, 1911-12

1. Total number of students.....	378
2. Number of conditions.....	421
3. Number of failures.....	259
4. Number of students dropped.....	21
5. Number of students left.....	14

Out of the number of students that were dropped, six were dropped during the first semester, and fifteen were not allowed to return the second semester.

Changes in the curriculum.—In 1908 the old four-year course leading to the full Engineering degree, was succeeded by a five-year course. This advance in standard, requiring the devotion of an additional year in preparation for professional work, while well-known institutions in other states require but four years, has had the anticipated and inevitable effect of temporarily reducing the number of students. It is confidently expected that the numbers will come flooding back when the advantages and prestige of the longer preparation are understood, and the adequacy of the training and the exceptional opportunities are realized. In 1910-11 a course in Architecture was offered in the freshman year. The next year, 1911-12, owing to financial stress it was discontinued. This temporary discontinuance threw some men out of the College. The re-establishment of the Architectural work this year and the growing completeness of the facilities for work, promise a large registration for the future. The registration for this year will pass the four hundred mark. The temporary handicap of the introduction of the five-year course is demonstrated as past by the fact that the incoming freshman class will exceed 150 men; and by the further fact that 46 seniors of last year in the five-year course have returned for the fifth, or post-senior,

year's work. Some apprehension was felt as to the return of the graduates of last year, and the outcome is most satisfactory.

Geographical distribution of students.—The 334 students from Minnesota were distributed by counties as follows: Aitkin, 1; Anoka, 3; Becker, 1; Bigstone, 4; Blue Earth, 3; Carlton, 1; Chippewa, 2; Chisago, 2; Clay, 1; Cottonwood, 2; Crow Wing, 1; Dakota, 3; Dodge, 1; Douglas, 2; Faribault, 3; Fillmore, 6; Freeborn, 4; Goodhue, 3; Hennepin, 150; Houston, 2; Isanti, 2; Jackson, 1; Kanabec, 2; Kandiyohi, 2; Kittson, 1; Lac qui Parle, 1; Le Sueur, 3; McLeod, 2; Marshall, 2; Martin, 4; Morrison, 1; Mower, 4; Murray, 2; Nobles, 1; Norman, 2; Olmsted, 3; Ottertail, 2; Pennington, 1; Pine, 2; Polk, 1; Ramsey, 53; Redwood, 2; Renville, 2; Rice, 2; Rock, 4; Saint Louis, 7; Sherburne, 2; Sibley, 5; Stearns, 1; Stevens, 2; Todd, 3; Traverse, 2; Wabasha, 1; Waseca, 2; Washington, 3; Watonwan, 2; Winona, 2; Wright, 4; Yellow Medicine, 1.

The 42 from other states were distributed as follows: California, 1; Illinois, 1; Iowa, 5; Kansas, 1; Massachusetts, 3; Missouri, 1; North Dakota, 5; Ohio, 1; Oregon, 2; South Dakota, 6; Washington, 2; Wisconsin, 14. Two foreign countries were represented by one student each.

This distribution is significant in the fact that it shows the student body to be made up of over 88 per cent of Minnesota men. The fees up to the present year have discriminated against men not residents of the State, and have tended to bar the men of surrounding states. With the increasing facilities of the College and the termination of the double fee, the percentage of outside men will doubtless increase.

Value of an Engineering College.—It is believed that the increment of state population and the corresponding increment of property values in the State growing out of the presence of a great technical College, make the development of such a technical College a sound financial investment for the State. In addition the State receives into her citizenship an army of virile young men competently trained to develop economically her physical resources and to advance by sound technical judgment the material well-being of her communities. When the immense community loss coming from faulty engineering design and construction is taken into account, and the loss in uneconomical manufacturing processes, the desirability of sending out these commissioned officers of the technical army becomes apparent. Germany's industrial supremacy has grown out of her trade schools and her technical colleges.

Opportunities and possibilities.—The conditions which create and justify a great technical school are so peculiarly existent for the College of Engineering here, that with adequate support great growth is inevitable. It is for this reason that plans for the future College have been blocked out on a large scale, and that recent constructions have contemplated not a minor college but a major college. The present wealth of the State of Minnesota and its certain growth in wealth, coupled with the ultimate productivity of the endowment of the University, warrant a large treatment in the expansion of all desirable colleges of the University. The present size and prominence of the University assures its

ultimate place among the few leading universities of the country. A recent writer has named the five universities ultimately to surpass all others in this country to be Columbia in New York, Harvard in Boston, Chicago in Chicago, Minnesota in Minneapolis-St. Paul, and California near San Francisco. The College of Engineering as a part must develop with the whole.

Relations with other colleges.—The College of Engineering is vitalized by all the other colleges which make up the University. A technical school which forms part of a great university has a tremendous opportunity for excellent training which schools existing separate and apart from a great university lack. This advantage is not alone in the fact that the engineers and architects become broader and more versatile men and better citizens from their contact with men studying for Law, Medicine, Agriculture, and Business; nor is it dependent on the fact that knowing many men of various views gives that knowledge of human nature and that ability to deal with men which underlies the successful administration of engineering works and commercial organizations; but it grows out of the fact also that engineering students get better and more specialized work when they study Engineering Law in a Law School of standing, when the Sanitary Engineer takes work in the School of Medicine, when Geology, Chemistry, and Economics are taken with the facilities and personnel of a great university. To form part of a great university is a tangible asset to a technical college in its work of giving the most efficient training to engineers and architects.

Importance of an urban location.—While the advantage to a technical college of its university connection is important, the opportunity afforded by the city location for the most efficient training of engineers and architects, is still greater. A technical college must for highest usefulness exist in a growing, building, manufacturing center of large population. In the past some of our best technical schools have developed in small towns, but it is believed that this development belongs more to that period when the theoretical part of an engineer's training was not so much supplemented by modern instances of practice as is now urgent. Specialized practical training is growing more and more important as the complex community mechanisms multiply. To live and study in the atmosphere of actual engineering and architectural activity is the "student's wiser business." The theory of the class-room blends with the fact of the city structure. Precept and example meet for the most efficient training of technical men. The Twin Cities have more than half a million of population, with the promise of a million in less than twenty years.

The advantage of the city location is not alone in the fact that engineering structures in the building or complete—steam plants, factories, shops, railways, bridges, water powers—serve as studies and as detached supplemental college laboratories, nor that the cities furnish work for self-supporting students; but in addition practicing engineers and architects may supplement the Faculty and give that touch of reality and actuality which practicing specialists can contribute when serving as

lecturers. Up to the present time few of the urban advantages have been adequately utilized.

The combination of university and urban location exists in comparable measure for but five other technical colleges in this country.* These are Columbia in New York, Pennsylvania in Philadelphia, Harvard in Boston, Washington in St. Louis, and California near San Francisco. With Pennsylvania, Columbia, and Harvard near the Atlantic seaboard and California on the Pacific, Minnesota must ultimately dominate the north middle area of the country. By reason of her city location Minnesota must in the end draw her students from a vast area of country, including Wisconsin, Illinois, Iowa, Kansas, Nebraska, the Dakotas, and westward to the Rocky Mountains and the Canadian Northwest, provided the State of Minnesota is willing to educate them. Here is a question of policy.

It has been shown how few men are attracted from outside the State now. It is believed that the obligation lies upon the State to offer freely

*GROUPINGS OF SOME OF THE PRINCIPAL TECHNICAL COLLEGES
OF THE UNITED STATES.

GROUP I

Technical colleges in cities of over 500,000 population, and in large universities

COLLEGE	CITY	POPULATION (1910)
Columbia	New York, N. Y.	4,767,000
Pennsylvania	Philadelphia, Pa.	1,549,000
Harvard	Boston, Mass.	671,000
Washington	St. Louis, Mo.	687,000
Minnesota	Mpls.-St. Paul, Minn.	516,000

GROUP II

Technical colleges in cities of more than 100,000 and less than 500,000 population, and in large universities

COLLEGE	CITY	POPULATION (1910)
California	San Francisco, Cal.	417,000
Cincinnati	Cincinnati, Ohio	364,500
Yale-Sheffield	New Haven, Conn.	133,600
Syracuse	Syracuse, N. Y.	137,200

GROUP III

Technical colleges in cities of over 70,000 population, but not forming parts of large universities

COLLEGE	CITY	POPULATION (1910)
Armour	Chicago, Ill.	2,185,000
Boston Tech.	Boston, Mass.	671,000
Case	Cleveland, Ohio	561,000
Worcester	Worcester, Mass.	146,000
Rensselaer	Troy, N. Y.	76,800
Stevens	Hoboken, N. J.	70,300

GROUP IV

Technical colleges in small cities, but forming parts of large universities

COLLEGE	CITY	POPULATION (1910)
Cornell	Ithaca, N. Y.	14,802
Michigan	Ann Arbor, Mich.	14,800
Illinois	Urbana-Champaign, Ill.	20,700
Wisconsin	Madison, Wis.	25,500
Nebraska	Lincoln, Neb.	44,000
Iowa	Iowa City, Iowa	10,100
Purdue	Lafayette, Ind.	20,100
Kansas	Lawrence, Kansas	12,400
Green	Princeton, N. J.	5,100
Missouri	Columbia, Mo.	9,700
Thayer	Hanover, N. H.	1,400

a training that can be more effectively accomplished here than in neighboring states or provinces.

Expert service for the State.—A technical college as an asset of the State may be measured not alone by its influence upon the growth of the State and the desirability of adding young men trained as engineers and architects to its citizenship, but in the usefulness and ability to serve of the group of older men who form the Faculty of the college. The use of this group of technical experts as consulting engineers for the solution of many of the problems relating to the physical betterment of the State must be extended. The problems of transportation by rail, highway, and waterway; of valuation and taxation; of drainage, of sanitation; of federal relations in water powers; of city lighting, terminals, parkways, and smoke prevention, must more and more be referred to the specialists of the Faculty. Growth of the college means higher specialization. In a small college a single professor may need to cover three or four specialties. In a larger college, each professor may adhere to his particular specialty. In the past the exigencies have burdened the professors with loads of instructional work that have left little time for other state service. Better organization, some clerical aid, more assistants, will release for higher service the high grade men of the Faculty. Some advance in this has characterized the past few years, but much remains.

A center for the engineering profession.—The College of Engineering must add to its primary function of educating young men as engineers and architects, and to its second function as an engineering Reference Bureau of the State, the third function of helpfulness to practicing engineers within reach of its resources. It has been planned to make the College of Engineering a focal point for the profession of the State. Perhaps the new central library of the College if adequately stocked with books will aid most in bringing this about. The new Engineering auditorium, where technical societies and conventions may meet, will supplement the library. The interest of the profession in the College will react by greater helpfulness on the part of practicing engineers towards the College. Some inclusion in the Faculty of practicing engineers and architects must be accomplished, as the strength of the College will be greater by this course.

New buildings.—During the past year the completion of the Main and Experimental Engineering Buildings has furnished adequate quarters for the departments of Experimental Engineering, Mathematics, Drawing, Civil Engineering, and Architecture. In addition the Central Engineering Library, the Auditorium, and the Administrative Department have been provided for. The departments of Electrical and Mechanical Engineering, each housed in a temporary building erected in 1901, have received no relief. It is most desirable that a new modern laboratory building for the work of the Electrical Engineers be constructed at once, in general conformity with the Cass Gilbert Plans. The building now occupied by the Electrical Department may then be turned over to the Mechanical Engineers to relieve a congestion in the machine and wood-working shops. It must be emphasized that not only the growth of the

College of Engineering itself, but the growth of the Schools of Mines and Chemistry, whose students take shop work here, make for the congestion in the Mechanical and Electrical Buildings. It does not appear good policy to erect any more temporary buildings at variance with the Cass Gilbert Plans, and the solution of the already serious difficulty will be best made by the erection of an adequate permanent Electrical Engineering Building, turning the present Electrical Laboratory into shops. Electrical Engineering has been transformed in the past ten years. Our own Electrical Laboratory, with practically no equipment fund in eight years, lags behind the times. One of our alumni has stated that "ninety per cent of our equipment should go into a museum of antiquities." The College of Engineering confidently expects to be the beneficiary in some form of the great electric power to become available on the completion of the High Dam in the Mississippi River. To have the use of cheap power will add greatly to the prestige of the Department, and is an additional reason for hastening the erection of a new Electrical Building.

The High Dam and the relation of the College of Engineering to this project, will be discussed in a special report.

Recommendations.—It is urgent that some new electric equipment be purchased by another spring to bridge over the year during which a new building is under construction.

It is urgent also that funds be made available for the expansion of our shops. In the past eight years little equipment has been added. Such machine tools as standard shops contain should be added to the meagre present equipment.

Further additions to the equipment of our new Experimental Engineering Laboratory should be provided. A legislative casualty crippled the original appropriation for this purpose, and the present equipment is somewhat sparse.

It is desired to enter a protest against the present entrance requirements. It is believed that fundamental defects exist in determining who may enter this College and who shall be barred.

A shorter teaching year.—It is further desired to record a conviction that the college year should be compacted by the elimination or shortening of non-essential recesses, to the end that the college year begin about October 1st and end about June 1st. It is believed that the same work now done in nine months may be accomplished in eight months. A summer vacation of four months will serve for the better training of engineers by reason of the field and shop practice made possible. Since many of our students are self-supporting, in part at least, it appears most desirable to permit them to earn more money in four months to carry them through an eight-month college year, rather than to force them to earn less money in *three* months to carry them through a longer college year.

Respectfully submitted,

FRANCIS C. SHENEHON, *Dean*

THE DEPARTMENT OF AGRICULTURE

HISTORY AND PRESENT STATUS

College of Agriculture (including Home Economics).—This is a college of university grade. It fits men for special advanced work and advanced positions in agricultural lines, and prepares women for teaching and other advanced work in the science of home-making. A thorough collegiate education is combined with practical training. This college was provided for by an act of Congress in 1862, but did not open until 1888. Until 1909 the growth was slow; since then it has been rapid. One hundred and twenty-three students have graduated. They have become instructors in agricultural colleges, experiment station investigators, expert technicians, managers of farms or farming associations, etc. During the year 1911-12 three hundred and fifty-three students, not including those in Forestry, attended the College. The demand for agricultural education and the application of science to home-making and to farming has become so wide-spread that a large force of technically trained men and women is needed to solve the social, economic, educational, and agricultural problems of the people of the State in order that the comforts of the home and the profits from farming may be increased. The College of Agriculture supplements the investigational work of the Experiment Station and carries information to the farmers of the State through bulletins, through the agricultural press, and in its extension activities, and has added millions of dollars to the production of the State by encouraging the growth of better grain and live stock, and by scientific methods of managing the soil and the farm as a whole.

College of Forestry.—This is a college of university grade, and trains men along technical forestry lines, for private forest administration, government forest positions, and special related industries,—combines a broad collegiate training with technical work. The Forestry course was opened in the College of Agriculture in 1903, and the College was established in 1910. It has graduated forty-five students, most of whom have entered the United States Forest Service. Some have become teachers in other forestry schools or have entered State Forest Departments, while others have gone into lumbering or other corporations. During the year 1911-12 sixty-four students were in attendance. The time has come when the forest lands of the State ought to be put under forest management and made productive. The College of Forestry trains men to handle this work. The geographical location of the Minnesota College of Forestry gives a decided strategic advantage in the keen competition between the various "Forest Schools" of the country. The

co-operation of the United States Forest Service and the use of the Forest Experiment Station at Cloquet and Itasca furnish excellent opportunities for needed research as well as teaching facilities. The work of the College is closely correlated with the State Forest Service.

Schools of Agriculture.—There are three of these schools: the Central at St. Anthony Park, the Northwest at Crookston, and the West Central at Morris. These schools are continuation Schools of Agriculture and Home Economics, of high school grade, and are open to boys and girls after they have completed work in the rural schools. They fit the boys for better farm life and the girls for better home life. Practical subjects are taught relating to the farm and home, as well as such academic subjects as will help to make intelligent citizens. They are among the most important and most practical solutions of "back to the farm" and "back to the home," and fill a place in the educational system not occupied by any other schools. These schools have been a most valuable investment for the State of Minnesota from whatever standpoint they may be viewed. The Central School, since its beginning in 1888, has sent back to the farms and homes of the State about eighty per cent of the one thousand four hundred and sixty-seven girls and boys who have graduated, as well as over thirty-seven hundred who have not completed the course. These boys and girls have made better farms and better homes, and are the best possible means of elevating the farm and home that the State can command. Through its graduates the School of Agriculture is dignifying, improving, and making more profitable and attractive the farm life and home life of the State. The fact that three-fourths of the graduates have returned to the farm is the best evidence of the value of these schools to the State. The appreciation of the value of the training offered is shown by the attendance which has increased from 47 in 1888 to 407 in 1900 and 880 in 1911. The school at Crookston (established in 1905) and that at Morris (established in 1909) are identical in purpose and in results to the Central School, and are showing a healthy and rapid growth.

The Experiment Station.—The main Experiment Station is located at St. Anthony Park. There are agricultural sub-stations at Crookston, Morris, and Grand Rapids and sub-stations for Forestry work at Cloquet and Itasca. The stations conduct experimental work along many agricultural and forestry lines, on the one hand investigating problems of the most vital importance to the agricultural interests of the State, on the other bringing to the farmers of the State the latest and best results of investigations from all sources. The Station controls about 540 acres of land (about 123 rented) at St. Anthony Park. In addition the sub-stations have the following amounts of lands largely available for experimental purposes: the Northwest station at Crookston, 480 acres; the North Central at Grand Rapids, 455 acres; the West Central at Morris, 290 acres. In addition the Southeast farm at Waseca (246 acres) and the Northeast farm at Duluth (240 acres) are available for experimental, educational, and demonstrational purposes. The work of the Experiment Station is divided among the ten large divisions as follows:

(1) Dairy and Animal Husbandry, (2) Agronomy and Farm Management, (3) Horticulture, (4) Veterinary Science, (5) Entomology, (6) Chemistry and Soils, (7) Plant Pathology and Botany, (8) Agricultural Engineering, (9) Forestry, and (10) Bureau of Agricultural Economics Research.

(1) Division of Dairy and Animal Husbandry.—The Dairy Husbandry Division was established in 1891. Experiments have been conducted along several lines. First, the cost of food consumed and value of dairy products returned; second, the relation of nutrient in the food to milk solids returned. It has been clearly shown that unprofitable cows can be separated from the profitable. A standard which is now recognized throughout this country and in many foreign countries has been established for the selection of profitable cows, based upon conformation and other physical indices. The feeding experiments have led to the establishment of feeding standards known as "Minnesota standards," which have made it possible to increase greatly the products per cow and have made possible double and even treble profits. The growth of the dairy industry in Minnesota has been from 7½ millions of dollars in 1890 to 34 millions for butter alone in 1909. The co-operative creameries are second only to those of Denmark and are largely responsible for the increase in the dairy industry. *The Dairy Division of the Experiment Station has been instrumental in the organization and establishing of almost every one of the first five hundred co-operative creameries in the State.* Moreover, most of the butter-makers in Minnesota, and many in the neighboring states, have been trained in the Minnesota Dairy School. Butter made in these Minnesota creameries has taken eight out of ten first prize banners offered by the National Butter and Cheese Makers' Association. The State also won the Grand Prize at the Paris Exposition for creamery butter.

The principles of animal nutrition in beef production are also being at present extensively investigated. Exact records are obtained of all food consumed and of all products obtained in beef, wool, energy of farm labor, etc. The present experiments are directed toward the establishment of standards of feeding and nutrition for all kinds of live stock and the reduction of these standards to a scientific basis such as has already been established for the dairy cow.

(2) Division of Agriculture and Farm Management.—Field crop breeding is one of the main lines of work in this Division. Since 1893 a number of new and improved varieties of various field crops have been developed and widely distributed throughout the State. The Division has put into the hands of approximately 4,000 farmers and co-operative seed breeders, in various parts of the State, about 18,000 bushels of improved seed wheat and corn, with an increased yield efficiency of from fifteen to twenty-five per cent. Large quantities of other improved grains and forage plants have also been distributed. The corn belt has been pushed north in the State as the result of the distribution of Minnesota No. 13 corn almost 200 miles, and another variety, Minnesota No. 23, has been developed which bids fair to thrive up to the northern limits

of the State. Through the co-operative seed breeders these varieties have been widely extended in this and neighboring states, and are rapidly taking the place of inferior or run-out varieties.

For the past ten years this Division, in co-operation with the U. S. Department of Agriculture, has kept a careful record of all of the work on a series of typical farms in different parts of the State. The data thus secured, together with the results obtained from crop rotation investigations conducted at the University Farm, in connection with these cost production studies, are proving invaluable in placing Minnesota farming on a business basis, and in outlining the management of the new type of demonstration farms organized this year. These demonstration farms are typical farms run by the owners according to a plan furnished by this Division in co-operation with the Extension Division. The whole farm business is included. The farmer's success depends chiefly on his own resources aided only by direction from the State experts. About fifty farms are being operated under instruction and supervision from this Division and the Extension Division. The interest aroused and the tendency toward improved methods of farming in the localities where this work is under way are very noticeable.

Weed eradication experiments are carried on by this Division, especially in regard to quack grass. Methods of control of this pest have been clearly demonstrated.

(3) Division of Horticulture.—This Division has charge of the introduction, testing, and breeding of horticultural and orchard crops. It studies the various methods of garden truck culture and management of orchards. It has inaugurated numerous investigations in the introduction and development of hardy varieties of apples, plums, and small fruits. In connection with the work in orchard crops it has established a fruit farm at Zumbra Heights where investigations promising important results have been started. This Division has been intimately associated with the work of the Minnesota Horticultural Society, and has had a very large effect on the development of horticulture in this State.

(4) Division of Veterinary Science.—This Division has charge of the investigational work on diseases of live stock. It has been active in the establishment and work of the State Live Stock Sanitary Board which has done much toward the improvement of the health and the eradication of disease, and co-operates with that Board in the general study and control of animal diseases. The main problems investigated in the past and now under investigation are: stable ventilation, anti-tuberculosis vaccine, anti-hog-cholera vaccine, and swamp fever. The Division has undertaken to introduce and distribute anti-hog-cholera vaccine as widely in the State as possible. It has also started important studies with a view of finding more economical methods of production and of investigating the conditions involving potency of anti-hog-cholera serum. Swamp fever is being studied in co-operation with the U. S. Department of Agriculture and the State Live Stock Sanitary Board.

(5) Division of Entomology.—This Division has under investigation the insect pests of plants and animals of Minnesota. Studies are made

of the life history and habits of insects affecting all kinds of Minnesota crops, the methods of combating them, especially those of practical value to farmers, orchardists, and lumbermen throughout the State. Co-operative experiments are carried on with farmers in spraying, etc. The inspection of nurseries and imported nursery stock is carried on by this Division and the entomologist of the Experiment Station is by law the State Entomologist.

(6) Division of Agricultural Chemistry and Soils.—In Agricultural Chemistry lines the following receive attention: animal foods, digestibility and feeding value of fodders, grains, grasses, and milled products, human foods, nutritive values of different kinds of flours, effect of cooking on composition and digestibility of foods, flour and wheat chemistry, including studies of chemical and milling properties of wheat, establishment of value of chemical control of milling processes, and the establishment of model flour and grain testing laboratory, and industrial alcohol investigations for the manufacture and study of various uses of industrial alcohol. Co-operative oat breeding experiments with the Division of Agriculture have been under way for some time, looking toward the increase of protein in oats.

Soil survey investigations have been carried on for some time and are still under way in the study of soil types in relation to crop yields and soil contents, also in the study of the effect of different methods of cropping on the fertility and the loss of valuable soil constituents. Studies have also been started in fertilizers and in fertilizer experiments. A survey of the soil types in every county is being planned and ought to prove of inestimable benefit to agriculture in the State.

(7) Division of Botany and Plant Pathology.—This Division has charge of the study and prevention of diseases of economic plants. The annual loss to the State from such diseases as smuts, rusts, mildews, etc., amounts to several millions of dollars. A large percentage of this loss is preventable. The investigation of new diseases and dissemination of information to farmers of the methods of combating old and well-known diseases are the chief lines of this work. An active campaign has also been begun in the making of a disease survey in the State in order to find out what diseases are doing the most damage. This will furnish the basis for more efficient experimental work.

A seed laboratory has been established by this Division and an active campaign for pure seed is being carried on. This laboratory tests seed, both for purity and germination, for the farmers free of charge. This is one of the most important phases of botanical agricultural work. The question of good seed, not only as to variety, but as to purity from weeds and power of germination, is of the greatest importance.

This Division also works in co-operation with the Division of Agriculture in investigating the methods of eradicating weeds. Weeds are identified for farmers and an effort is made to enable the farmer to recognize the common weeds of the State in all of their phases, of seed, seedling, and mature plant. Farmers are warned against the introduction of new and dangerous weeds. A collection of common weed seeds has been issued

which is available to every farmer in the State at cost. It will enable him to recognize the more common weed seeds.

(8) Division of Agricultural Engineering.—Since the organization of the Division in August, 1908, under-drainage systems for eight farms have been planned and their construction supervised, requiring a total of twenty-three miles of tile varying in size from four to twenty inches. Data have been collected, and some experimental work carried on for the purpose of improving present methods of farm drainage construction. Some time has been given to the testing of the cheaper grade of surveying instruments, the object being to determine the value of these instruments for use by the farmer. In the summer of 1910 a man was employed for three months on a study of peat and muck lands in the State, the object being to determine if possible the best methods of cultivating these lands and their actual value for agricultural purposes. Two small areas of these lands have been drained and are now being placed under cultivation. Some attention has also been given to the sanitary drainage of farm buildings. Several septic tanks have been installed from plans furnished.

(9) Division of Forestry.—The main experimental work is carried on at the Cloquet Forest Experiment Station where the State owns a tract of 2,700 acres. Experiments are under way here in the testing of varieties of trees suitable for this section of the country and introduction of plants from other parts of the world, experiments on re-forestation, etc. It is aimed here to work out in an experimental way problems that will confront the practical work which the State will have to do in re-forestation of cut-over lands. Although the chief work at Itasca Park is in connection with the Forest School, a number of experiments have been started and the foundation has been laid for one of the best tree nurseries in the country. The co-operation with the State Forestry Board has also made it possible to work out experimental problems in the administration of the Park.

A study of preservatives in connection with timbers, particularly fence posts and other farm timbers, offers one of the most inviting fields along forestry lines. The experimental work has already been under way for two years and co-operation with farmers in different parts of the State has been started.

The wood lot is a growing problem on the farms of Minnesota. In the southeastern part of the State some have been retained. In the prairie sections forest plantations have been started. Few of the wood lots and plantations are successfully managed. The Division should give help and information along this line.

(10) Bureau of Research, Agricultural Economics.—The Board of Regents in November, 1911, organized a Bureau of Research in Agricultural Economics in the Department of Agriculture. While the name, Agricultural Economics, suggests in a general way the scope of the work to be undertaken by the Bureau, a more definite outline of the investigations contemplated is submitted below. Because of the peculiarly pressing problem presented by external economies affecting the value of products from the time they leave the farm until they reach the con-

sumer, immediate attention is being devoted to certain aspects of the marketing and distribution of farm products with a view of studying the comparative value of different agencies performing middlemen functions in their relations to the returns of the farmer. The situation in different parts of Minnesota is subjected to special inquiry. Data are being gathered bearing on marketing and distribution in other states and in foreign countries so far as such information may be of value in relation to conditions in this State. Separate studies are made for different kinds of farm products. Thus, the marketing of a perishable crop of vegetables involves the use of a different machinery from that of a staple product such as wheat. What economic functions must be performed in each case and what mechanism is best adapted to this need is what we shall try to throw light upon as a result of our investigation. In the comparison of various methods employed, attention is devoted to the achievements of various kinds of co-operative effort in this field. By a comparative study of different types of organization, we hope to learn just what sort of co-operative effort may be expected to be successful. We are taking up the problems connected with the distribution and sale of all the important farm products such as fruits, vegetables, milk, butter, eggs, meats, cattle, and hogs, and the leading grains produced in Minnesota.

Another line of inquiry is that of agricultural credit. We are gathering and want to place before the farming communities whatever information is available regarding the various facilities for credit that have been of value in other parts of the world. The problem of securing sufficient capital under favorable conditions is a vital one for the farmer and suggests the need of some kind of associated effort that will enable him to improve his credit. The Bureau will also investigate certain aspects of the land problem. A study will be made of systems of registering titles to lands, methods of transfer, and means of acquiring lands. We shall want to compare the different kinds of relations between landlords and tenants with a view of ascertaining factors that make for efficiency or inefficiency. Certain social and political aspects of the rural problem will also be considered. The different forms of community life, the tendency towards absentee landlordism, and the migratory movement between rural and urban communities will be given attention. In this way, it is aimed to make the Bureau a center for intelligent study along many lines of interest to the people of the State. Finally, it is planned to disseminate this information through the publication of bulletins showing the results of our investigation.

Experimental and Educational Sub-Stations.—The farms located at Crookston, Grand Rapids, Morris, Duluth, and Waseca serve a valuable purpose in the experimental work pertaining to the localities which they serve. Their work is local both as to experiments and in educational work. The Crookston and Morris stations are operated in connection with the Schools of Agriculture at those places. Variety tests and farm management, demonstrational and other experimental and educational methods are used to build up the agriculture of the districts in which

they are placed. A close correlation and co-operation is maintained with the Main Station at St. Anthony Park, avoiding unnecessary duplication, and making available the information and experimental results accumulated at this Station.

The Fruit Breeding Farm.—The State Fruit Breeding Farm was established by an act of the Legislature of 1911, for the express purpose of breeding hardy tree fruits for Minnesota. It is under the supervision of the Division of Horticulture of the Experiment Station. Eighty acres of land were purchased at Zumbra Heights station, Lake Minnetonka; a dwelling house, barn, and greenhouse were erected. Some fifteen thousand plum and apple seedlings were transferred from the central station. Many of them are fruiting and some half dozen are being propagated for distribution in the State. Thousands of crosses have been made under glass and the seedlings planted in the field. Promising returns have already been obtained from many of these, although several years' test must be made before their real worth is known. During the season of 1912 several thousand seedling strawberries, raspberries, and grapes have fruited. Among these seedling grapes is one that is hardier and of better quality than Beta, which was distributed by the Division of Horticulture several years ago. These, as well as other seedling fruits, will be sent out over the State as fast as they demonstrate their superior value.

Owatonna Tree Station.—The Owatonna Tree Station was established about 1890. Its purpose was to test new varieties of apples and also to grow seedlings in an attempt to develop new varieties of hardy apples for the State of Minnesota. Several thousand seedlings have been grown, and most of them have been carried to the fruiting age. Some half dozen selections of these have proven promising and are being thoroughly tested. With the establishment of the Fruit Breeding Farm at Excelsior no new work has been undertaken at Owatonna. This Station will be used in the future largely as a trial station for new varieties developed at the Fruit Breeding Farm.

The Forest Experiment Stations at Cloquet and Itasca Park.—The Cloquet Station is mainly devoted to experimental work, and the co-operation of the U. S. Service in extensive experiments of importance to Minnesota forests has been obtained for this work. The Itasca Station is utilized chiefly in connection with the Forest Summer School (see below). Experimental work is, however, carried on with the co-operation of the State Forestry Board.

The Itasca Summer School of Forestry.—The Itasca Summer School of Forestry at Itasca Park consists of the summer session of the junior class of the College of Forestry. The practical field work carried on here gives the necessary insight to the students into the theoretical work of the class-room.

The Dairy School.—A special technical school for dairymen where they may learn the latest and best methods of making and handling dairy products and the care of dairy cattle. The Dairy School was founded early in the history of the Agricultural Department of the University of

Minnesota, and is intended to furnish instruction to butter and cheese makers already engaged in practical work. The instruction given is, therefore, far from elementary in its nature, since one year's preparatory work in an accredited creamery is required of all students who contemplate taking the course. In this way the maximum results are obtained at a minimum expenditure. While no effort has been made to advertise the School, the annual enrollment reaches the hundred mark. The results over the State have been very pleasing in that the graduates of this School have carried off a large portion of the highest awards wherever creamery butter has been exhibited. Eight times out of ten they have won the banner for the highest average score at National Contests.

Farmers' Short Course.—This is a special course of four solid weeks' work for farmers and farmers' wives, given in mid-winter when all may attend. It is open to any farmer in the State. Practical courses are given in most lines of improved methods of farming. A most valuable aid in the up-lift of farm conditions and a splendid link between the Department of Agriculture and the farmers of the State. Minnesota has adhered to the policy of holding a Farmers' Short Course as one of the short courses of the School of Agriculture for not less than one month each year. During that month students taking the course are given regular class work by lecture, demonstration, and practise. It is believed that in one month, a decided impression may be made that will affect the practise of the farmer student when he returns to the farm. It would be possible to hold a mass convention at the school for a few days, but the term of not less than one month's duration, with a regular attendance of more than two hundred farmers, meets our conditions better than the school of a few days in length.

School of Traction Engineering.—This is a special technical school for traction engineers, to prepare men for the operation and care of traction engines and similar machinery. The use of small power units on the farm, for pumping, separating, and churning, and of large ones, both steam and gasoline, for threshing, shredding, and plowing, makes special training in the care and handling of these outfits a necessity. The school holds its session for a period of one month, beginning about the middle of May. Previous to 1911 there were no entrance requirements for this course. The attendance was from 140 to 150 students. In 1911 it was thought advisable to require for entrance one season's experience with either a plowing or threshing outfit. This has reduced the attendance to about forty and the work is much more satisfactory to both students and instructors.

Summer Session of the College of Agriculture.—This session is for men and women and gives college work and credit along Agricultural and Home Economics lines to assist teachers in the schools of the State to learn and teach practical subjects of greatest importance to the farm homes of the State. It constitutes a valuable means of spreading agricultural information widely throughout the school system of the State.

State Teachers' Training School.—In connection with this Summer Session of the College of Agriculture is held the State Teachers' Training

School, conducted in co-operation with the State Department of Public Instruction. A great variety of subjects are offered both in Academic, Agricultural, and Home Economics subjects. Teachers may prepare for examination, for certificates, and in first grade subjects may receive credit to apply on a certificate.

The Agricultural Extension Division.—The aim of the Agricultural Extension Division is to carry to the million people on Minnesota farms, available scientific and practical knowledge which will enable them to make their work more profitable, and to raise the standard of living in the country to the highest possible level. Some of the methods we have used in accomplishing this result may be briefly enumerated. The State Industrial Contest, including a Corn Acre-Yield Contest with 1,300 contestants, a Potato Yield Contest with 1,000 contestants, and a general Industrial Contest in the production of farm crops, sewing, baking, manual training and booklet work, with from 10,000 to 15,000 contestants have proven successful. About 150 farmers' clubs are now organized and are furnished outlines of timely topics for their monthly meetings. Twenty demonstration farms are operated under the supervision of this Division. Special educational trains have been run over the northeastern part of the State. Nearly all of the county fairs are supplied with judges, and many are visited with our demonstration tents. Thirty-five short courses were held in co-operation with the local high schools. Special lecturers have been supplied at creamery meetings, school officers' meetings, county fairs, farmers' clubs, and other agricultural meetings throughout the State.

A number of publications are issued regularly. The *University Farm Press News* is a one-page, five-column sheet, published semi-monthly and sent to all the newspapers in Minnesota and adjoining states. The sheet contains short articles and notes of timely interest to farmers. An Extension Bulletin is published monthly. Each bulletin consists of from 8 to 20 pages, is illustrated, and deals with some practical farm topic in a concise and readable manner. Material is furnished every three weeks for a page of plate matter. It is used by some 60 country papers in the State. During the nine months of school a four-page leaflet dealing with simple elementary lessons in agriculture is sent to each of the 8,000 school teachers in the State. Special posters are issued occasionally to call attention to some matter of importance.

IMPORTANT CHANGES IN THE LAST TWO YEARS

Administration.—An analysis and basis for the organization of the entire Department of Agriculture has been worked out. The rapid growth of the Agricultural Department along all lines of work and the multiplicity of courses, schools, stations, and other outside agricultural and educational interests have made necessary administrative assistance in the office of the Dean and Director. To meet this need an Assistant Dean has been appointed. The position of Secretary of the Station has been discontinued. The clerical forces in the Business and Registrar's

Office have been strengthened and are operating in excellent order. An editor has been appointed to take charge of the editorial work and the publicity work of the whole Department of Agriculture.

Faculties.—Over thirty members of the Faculty have resigned and been replaced. In almost every case this has necessitated the payment of higher salaries in order to secure men of equivalent ability for this work. These were distributed as follows:

	Resigned	Appointed
Instructors.....	22	20
Editors.....	1	1
Librarian.....	1	1
Professors.....	0	4
Associate Professors.....	0	1
Assistant Professors.....	7	4
Secretary of Station.....	1	0

The following are the important new organizations and appointments made during the biennium: a Professor of Poultry Husbandry; an Expert in Fruit Breeding; a Professor of Forest Management and Lumbering; an Associate Professor of Dairy Husbandry; a Professor of Animal Husbandry; a Bureau of Research in Agricultural Economics.

Curriculum.—The rapid growth of the collegiate attendance has required considerable work in the organization and administration of the collegiate curriculum. The entrance requirements have been raised to a proper University standard. The requirements for graduation have not been greatly modified in the last two years. The two-year teachers' course in Home Economics has been discontinued, since it was found that not less than four years is adequate for the training of efficient teachers in Home Economics. As a result the attendance in the four-year Home Economics course has been greatly increased.

The curriculum of the College of Agriculture now allows of specialization starting in the junior year. The entire senior year is given up to specialization. The following lines are offered: Agronomy and Farm Management, Horticulture, Animal Husbandry, Dairy Husbandry, and Special Sciences. In addition the course has been modified in order to allow students in any line to elect beginning with the freshman year (by omitting the study of the modern languages) more than a sufficient number of educational courses to entitle him to a University teacher's certificate, and to obtain special training in the teaching of industrial and agricultural subjects. This meets satisfactorily every demand which the State can reasonably make in the way of preparation of teachers for Putnam, Benson-Lee, and other secondary schools.

Department of Agricultural Education.—A new Department of Agricultural Education has been organized. This department will co-operate with the Agricultural High Schools and the various divisions of the College of Agriculture and College of Education, the State High School Board, and the Department of Public Instruction in training teachers and organizing courses for Agricultural High Schools.

Five-Year Course, Schools of Agriculture.—In the School of Agriculture an important change in the curriculum has been adopted. The Intermediate Year of nine months between the School and College courses has been abolished and two years of six months are contemplated. In them will be furnished sufficient Academic work efficiently to equip the student for general requirements as well as college entrance. In addition special advanced work in the technical courses in agricultural lines will be offered, especially fitting graduates for teaching work in rural consolidated schools and for technical farm work, such as management of farms and other enterprises associated with agriculture.

Extension of Summer Practicums.—Another development in the School curriculum has been along the line of the summer work for school students. This work is gradually being more closely supervised and where possible the student's work on the farms is being personally supervised and inspected.

Segregation of College, School, and Station staffs.—The difference in the kind of teaching and qualifications of instructors in School and College have made it apparent that a segregation of the instructional staffs of the two institutions should be effected. The work in the School will probably be associated with the extension of the summer practicums work. The segregation of Experiment Station specialists from the teaching staff is also advisable, and an effort is being made to build up the segregation in all three lines. An additional force in the teaching and investigational staff will be required to complete this change.

Junior Short Course.—A new course has been begun, chiefly under the direction of the Extension Division, known as the Junior Short Course for boys and girls. This is held during the Easter vacation, and about 75 girls and boys attended the first session in the spring of 1911 and 310 in 1912. This attendance was largely made up of girls and boys who had won prizes in the County Industrial Contests, the prizes being expenses for one week of work at the Agricultural School. The visit and introduction to the School work as experienced by these children left a particularly strong impression and did a great amount of good.

Graduate work in the College.—A marked improvement has been effected during the last two years in the graduate work in the college. The Department of Agriculture offers the very best opportunities for the development of graduate work in its correlation with the Experiment Station, the chief interest of which is research work. The Graduate Committee of the College has been reorganized and has been satisfactorily correlated with the Executive Committee of the Graduate School. The Graduate Committee has organized the curriculum of the graduate work and in many ways has raised the standard required of graduate students in the College. A marked increase in the number of students taking graduate work is noticeable from the table found later in this report. The stimulating effect of the graduate work of the graduate students on the Station staff and College Faculty is worthy of note.

Buildings.—New additions have been built to the Girls' (School of Agriculture) Dormitory (\$17,000) and to the Dining Hall (\$30,000).

The latter addition, together with a remodeling of the basement, furnishes facilities for handling the Farmers' Short Course and other large bodies of students, in addition to the 1,000 or more School and College students. Alterations amounting to \$2,500 have been made on the Boys' New Dormitory. The new Mechanic Arts Building and Shops, costing approximately \$260,000, appropriated at the sessions of 1909 and 1911, is now in the process of construction and will probably be ready for occupancy early in 1913. A new wing (\$15,000) has been added to the Animal Nutrition Barn, a new barn (\$5,000) for work horses has been completed, and a hog barn (\$2,500) is now being built. Plans for the enlargement of the heating plant for which \$14,700 was appropriated in 1911 have been completed, and the work is now under way. This addition is planned to care for the additional buildings recently completed and now under construction. Plans for remodeling the Drill Hall (\$10,000, appropriated in 1911) will be put in operation as soon as the Engineering Division is moved to the new Mechanic Arts Building. This will provide some additional classroom and laboratory space. A denatured alcohol plant (\$6,000) has been completed and is now operating. A new sewer connecting the Station system with the St. Paul city system is almost completed (cost \$12,000). New mains with connections with the city water system have been built at a cost of \$3,000.

Experiment Station work.—A new division, the Bureau of Research in Agricultural Economics, has been added to the Experiment Station. Problems of marketing, co-operation, and other economic problems have been assigned to this Division. Laboratories are being established for co-operative work in the Veterinary Division, in co-operation with the State Live Stock Sanitary Board. Routine and research work affecting both co-operators will be carried on in this laboratory under the direction of the Veterinary Division.

New experimental projects.—With the aid of special State appropriations to the State Entomologist the Division of Entomology has begun a campaign against Minnesota grasshoppers, chiefly in the north-western part of the State. Field experiments and demonstrations have been carried on by a force of men in the infested district. A cheap and effective remedy has been discovered in arsenite of soda. The larch sawfly insect has recently become a serious menace to the valuable stands of tamarack in this State. A study of the history, parasitism as a method of control, and forest conditions with possibilities of lessening the destruction of the larch, are features of the work.

Minnesota contains many thousands of acres of peat soil and the ultimate disposition of this land is a matter of great importance to the State. A comprehensive project has been started with the co-operation of various Divisions in order to determine experimentally the exact conditions, possibilities, and effect of drainage; the chemical and bacteriological relations and the agricultural possibilities. The following Divisions are co-operating: Engineering Division on drainage and in general charge; Chemistry and Soils on soil determination; Plant Pathology on bacterial survey; Agricultural on agricultural crops.

The Fruit Breeding Farm at Zumbra Heights has completed much of its preliminary work. A large number of hybrids and varieties of plums, apples, and small fruits have been developed. The practical work of selection and distribution is now commencing. A new line of work under the Adams Fund has been recently started in the investigation into the scientific principles underlying the fruit breeding work. The Station offers excellent facilities for the pursuit and correlation of both lines of work.

A new irrigation project is being carried on by the Divisions of Engineering and Plant Pathology in co-operation with the Irrigation Section of the Office of Experiment Stations of the U. S. Department of Agriculture. Its object is to determine (a) the possibilities of profitable use of auxiliary water supply in time of drought, (b) the effect and cost of water under normal conditions, (c) the effect of irrigation (overhead sprinkling) on the common plant diseases, and (d) the use of water in preventing frost and prolonging the growing season.

A new Cloquet Forest Experiment Project is being conducted by the Division of Forestry in co-operation with the Forest Service of the U. S. Department of Agriculture and is both investigational and demonstrational. The Cloquet Station is a favorable location and typical of Minnesota forest lands. Physical, meteorological, biological, and other factors of importance in building up the forests, and practical methods of management, together with the development and demonstration of the best methods of management applicable to Minnesota form the main working lines of the project.

Cereal and flour investigations have been definitely organized, with a man specially trained in this line of work in charge. A complete model experimental bakery has been installed, together with additional milling machinery. A study is being made of the composition and milling value of the wheats of the State, this work to be continued from year to year. One of the most important unsolved problems of milling chemistry, strength of flour, is being investigated. Control work has been done for the State Board of Grain Inspection and for the State Board of Control.

A project for sorghum culture for forage and syrup has been begun by the Divisions of Agronomy and Farm Management and of Chemistry. The sorghum syrup industry in this State has gradually declined in importance during the past ten years, due to primitive methods of manufacture and lack of general interest in the industry, while the price of this syrup has greatly increased. An investigation has been started to determine the present conditions of the industry, its possible future, and needs for development.

The industrial alcohol investigations were inaugurated to determine whether the manufacture of industrial alcohol might not become a profitable and important agricultural industry in this State. An experimental alcohol plant of 100 proof gallons of alcohol capacity per day has been established and operated during the past year. The relative lighting value of kerosene and alcohol has been investigated and the results published as Bulletin No. 126 of this Station. The composition and value for

alcohol production of Minnesota potatoes has been determined. A general report of the problem is in course of preparation.

A commercial feeding stuffs project, undertaken in co-operation with the State Dairy and Food Department, consists of a study of the composition of commercial animal feeds on sale on our markets. Large amounts of such feeds are sold in the State, and a knowledge of their actual composition and possible adulteration is of practical importance to feeders, many of whom desire to know the actual amounts of nutriment present so that they can combine them properly in rations.

Other projects of the Experiment Station.—The Duluth and Waseca Educational and Demonstration Farms have recently been established for educational and demonstration purposes. The Duluth Farm contains 240 acres and the Waseca 246.02 acres. They will serve to illustrate the best methods of Farm Management for the section of the State in which they are located.

A Farm Survey of the Township of Northfield, Rice County, with the purpose of learning the investment and farm practises of the individual farmers, and the revenue derived from the various types of farming is also under way.

Publications.—The following bulletins have been published during the biennium. A number of bulletins are now either in press or ready for publication and will be completed before the end of the biennium: Bulletin No. 121, Orchard and Garden Spraying, Divisions of Plant Pathology and Entomology; Bulletin No. 122, The Smuts of Grain Crops, Division of Plant Pathology; Bulletin No. 123, Cutworms, Army Worms, and Grasshoppers, Division of Entomology; Bulletin No. 124, The Cost of Minnesota Dairy Products, Division of Agronomy and Farm Management; Bulletin No. 125, Farm Management, Organization of Research and Teaching, Division of Agronomy and Farm Management; Bulletin No. 126, Lighting with Alcohol and Kerosene, Division of Chemistry and Soils; Bulletin No. 127, Seed Laboratory Report, Division of Plant Pathology and Botany; Bulletin No. 128, The Relation of Different Systems of Crop Rotation to Humus and Associated Plant Food, Division of Chemistry and Soils.

The following publications have been published from this Station in co-operation with the U. S. Department of Agriculture: B. P. I. Bulletin No. 152, The Loose Smuts of Barley and Wheat, E. M. Freeman (Division of Plant Pathology) and E. C. Johnson (U. S. Department of Agriculture); B. P. I. Bulletin No. 216, The Rusts of Grains in the United States, E. M. Freeman (Division of Plant Pathology) and E. C. Johnson (U. S. Department of Agriculture).

The following Extension Bulletins have been published during the biennium: (1) Farmers' Clubs; (2) Suggestions to Those Desiring Agricultural Books and Bulletins; (3) Industrial Contest for Minnesota Boys and Girls; (4) Potato Growing in Minnesota; (5) Women in the Life on the Farm; (6) Clover; (7) Pork Production; (8) Poultry Houses; (9) Selecting and Storing Seed Corn; (10) The Care and Management of the Dairy Herd; (11) Dressing and Curing Meat for Farm Use; (12) Feeding

Dairy Cows; (13) Farm Drainage; (14) The Smuts of Grain Crops; (15) The Cost of Horse Labor; (16) Strawberries and Bush Fruits for the Farm; (17) The Farm Vegetable Garden; (18) Alfalfa Growing in Minnesota; (19) Domestic Science in Rural Schools; (20) Soil Tillage; (21) The Care and Management of Poultry; (22) Establishing the Orchard; (23) Some Common Insects and Their Control; (24) Seed Testing; (25) Annual Soiling and Hay Crops; (26) Seed Grain; (27) Flax Growing; (28) Tuberculosis; (29) The Keeping of Dairy Cow Records; (30) Marketing Eggs from the Farm.

III. EDUCATIONAL STATISTICS

The numbers of those who have completed the different courses in the Department of Agriculture are as follows: College, including Agriculture, Home Economics, and Forestry, 168; School of Agriculture, University Farm, 1,467; School of Agriculture, Crookston, 59; School of Agriculture, Morris, 5; Farmers' Short Course, 1,333; Dairy School, 1,832; School of Traction Engineering, 332.

Table I gives the student attendance in the College Courses of the Department of Agriculture for the last twelve years.

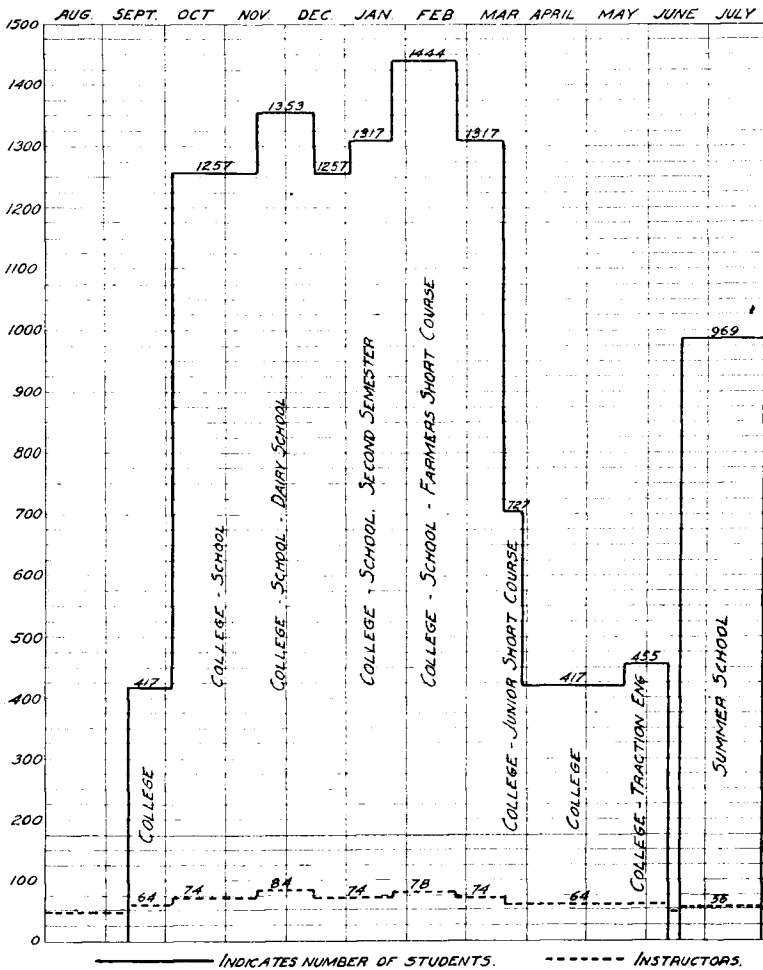
TABLE I. REGISTRATIONS, 1901-1912

	AGRICULTURE	HOME ECONOMICS	FORESTRY	TWO-YEAR HOME ECONOMICS
1901.....	23	0	0	0
1902.....	19	2	0	0
1903.....	14	3	0	0
1904.....	23	3	3	0
1905.....	25	3	4	0
1906.....	34	4	8	0
1907.....	41	18	12	0
1908.....	56	27	32	0
1909.....	71	37	72	8
1910.....	72	55	94	48
1911.....	107	69	113	123
1912.....	121	139	64	65

The chart on page 91 shows the total attendance of the students in all courses and schools at the University Farm for each of the twelve months of the year (1911-12) and also the instructional staff for the same periods.

Geographical distribution.—In the College of Agriculture for the year 1911-12 students from Minnesota were registered by counties as follows: Anoka, 1; Becker, 2; Bigstone, 1; Blue Earth, 7; Brown, 2; Carlton, 2; Chippewa, 3; Clay, 1; Cottonwood, 3; Dakota, 1; Dodge, 1; Douglas, 2; Faribault, 2; Freeborn, 1; Goodhue, 11; Hennepin, 99; Houston, 3; Hubbard, 1; Itasca, 3; Jackson, 2; Kandiyohi, 2; Kittson, 2; Lac qui Parle, 1; Le Sueur, 3; Lyon, 1; McLeod, 2; Marshall, 3; Martin, 3; Millelacs, 2; Morrison, 2; Mower, 2; Murray, 4; Nicollet, 2; Nobles, 2; Norman, 1; Olmsted, 5; Ottertail, 1; Pine, 1; Polk, 8; Ramsey, 73; Red Lake, 1; Redwood, 1; Renville, 4; Rice, 7; Saint Louis, 13; Scott, 4;

ATTENDANCE AT UNIVERSITY FARM 1911-12



Sherburne, 1; Sibley, 1; Steele, 5; Stevens, 3; Swift, 1; Todd, 1; Traverse, 1; Wabasha, 1; Waseca, 4; Washington, 9; Watonwan, 4; Winona, 2; Wright, 7; Yellow Medicine, 5. Students were also registered from the following countries and states: Canada, 1; Illinois, 5; India, 1; Indiana, 2; Iowa, 13; Kansas, 1; Montana, 1; New York, 2; North Carolina, 1; North Dakota, 3; Pennsylvania, 1; South Dakota, 4; Wisconsin, 13.

In the Central School of Agriculture for the year 1911-12, students from Minnesota were registered by counties as follows: Aitkin, 1; Anoka, 8; Becker, 2; Beltrami, 1; Bigstone, 5; Blue Earth, 10; Brown, 13; Carlton, 3; Carver, 5; Cass, 3; Chippewa, 12; Chisago, 13; Clay, 2; Clearwater, 2; Cottonwood, 9; Crow Wing, 4; Dakota, 12; Dodge, 3; Douglas, 6; Faribault, 5; Fillmore, 8; Freeborn, 5; Goodhue, 33; Grant, 5; Hennepin, 154*; Houston, 14; Isanti, 3; Jackson, 4; Kandiyohi, 8; Kittson, 2; Lac qui Parle, 8; Le Sueur, 11; Lincoln, 6; Lyon, 9; McLeod, 6; Marshall, 4; Martin, 10; Meeker, 9; Millelacs, 6; Morrison, 3; Mower, 15; Murray, 2; Nicollet, 5; Nobles, 4; Norman, 10; Olmsted, 11; Ottertail, 19; Pennington, 1; Pine, 7; Pipestone, 12; Polk, 5; Pope, 6; Ramsey, 95†; Red Lake, 1; Redwood, 13; Renville, 17; Rice, 13; Rock, 6; Roseau, 4; Saint Louis, 5; Scott, 2; Sibley, 9; Stearns, 7; Steele, 8; Stevens, 1; Swift, 12; Todd, 3; Traverse, 1; Wabasha, 8; Wadena, 1; Waseca, 4; Washington, 27; Watonwan, 8; Wilkin, 8; Winona, 8; Wright, 8; Yellow Medicine, 15. Students were also registered from the following countries and states: California, 1; Illinois, 4; Iowa, 3; Maryland, 1; Montana, 1; New York, 3; North Dakota, 6; Ohio, 2; Peru, 2; Russia, 2; South Carolina, 1; Texas, 1; Wisconsin, 12.

In the Farmers' Short Course registration from Minnesota by counties was as follows: Anoka, 1; Bigstone, 3; Blue Earth, 5; Carlton, 1; Carver, 5; Chippewa, 1; Chisago, 2; Crow Wing, 2; Dakota, 5; Fillmore, 1; Freeborn, 2; Hennepin, 22; Hubbard, 1; Jackson, 1; Kandiyohi, 2; Le Sueur, 2; Lincoln, 1; Lyon, 2; McLeod, 5; Marshall, 1; Meeker, 2; Millelacs, 1; Morrison, 3; Nicollet, 1; Norman, 1; Olmsted, 1; Ottertail, 6; Pipestone, 4; Polk, 2; Pope, 1; Ramsey, 3; Redwood, 6; Renville, 1; Rice, 1; Roseau, 2; Saint Louis, 1; Stearns, 2; Swift, 4; Waseca, 3; Washington, 1; Wilkin, 1; Wright, 1; Yellow Medicine, 1. Students were also registered from the following countries and states: Iowa, 1; North Dakota, 1; South Dakota, 2; Wisconsin, 2.

From the Department of Agriculture the following degrees have been granted in the period from 1901 to 1912 inclusive.

TABLE II. DEGREES GRANTED, 1901-1912

Bachelor of Science (Agricultural Course).....	80
Bachelor of Science (Forestry Course).....	45
Bachelor of Science (Home Economics Course).....	43
Total Bachelor of Science degrees.....	168
Doctor of Science.....	1
Doctor of Philosophy.....	1
Master of Agriculture.....	3
Master of Science.....	12
Master of Forestry.....	1
Total Advanced degrees.....	18

*One hundred and three of this number were from Minneapolis.

†Seventy-four of this number were from St. Paul.

Table III gives statistics compiled from the statements of ninety-two men and sixteen women, graduates of the Colleges of Agriculture and Forestry.

TABLE III.

Average cost per year while attending college, men.....	\$ 350.55
Average cost per year while attending college, women.....	494.00
Average salary (1912), men.....	1,893.00
Average salary (1912), women.....	830.00
Average age of men at entrance.....	21.94
Average age of women at entrance.....	18.8
Average age of men at graduation.....	25.93
Average age of women at graduation.....	22.6

Sixty-five per cent of the men had a definite aim at the time of entering the College, and 85.6 per cent of the women had a definite aim at the time of entrance.

IV. RECOMMENDATIONS AND SPECIAL NEEDS

Organization of the Department.—The Department of Agriculture is not only a large institution or collection of institutions, but it is of necessity intimately bound up with many public and local movements and enterprises throughout the State. The recent developments in agriculture have given a tremendous impetus to this work, and in order to keep pace with it the organization and administration of the whole department has been put on a flexible, expandible, yet firm and logical basis. The rapid development in agricultural educational interest has required many methods of attack to meet the various needs of the State as illustrated by the following institutions: College of Agriculture, including Home Economics; College of Forestry; Schools of Agriculture; Farmers' Short Course; Extension Work and Farmers' Institutes; Experiment Stations, etc.

The present system of organization involves broadly an executive head, viz., the Dean and Director. The work of education, experimentation, and demonstration is lodged in divisional organizations which are assigned to particular groups of problems segregated on subject lines. For instance, the Dairy and Animal Husbandry Division handles all problems of Dairy and Animal Husbandry in all phases of experiment and education in the College, School, and Station, and in a supervisory way in the Extension Work, and so with all of the other Divisions. So far as the work located at St. Anthony Park is concerned, it is desirable to correlate the sections in each subject in the Colleges, Schools, and Station by grouping them in one divisional organization, under the general supervision of a Chief of the Division. This insures co-operative use of equipment and laboratories, and avoids duplication not only in equipment, but in work. It provides not only for the segregation and unity of the work in College, School, and Station, but also unifies the work as a whole. The entire group of Agriculture and Forestry is supervised by the Dean and Director, with an assistant designated in each of the larger groups, as Agriculture, Forestry, Experiment Station, Central School, Northwest School, Northeast School, etc. These assistant

deans and directors are now all provided for with the exception of Assistant Director of the Station. That work is at present merged with the duties of the Assistant Dean of the College of Agriculture.

Of all institutions those purporting to be educational should be foremost in democratic government. An administrative and executive officer should be guided by the best judgment of those who have been appointed to carry out the details of work in his group. Each group above mentioned ought to have its organized faculties or staffs with power of legislation over that group. Appeal in case of disagreement ought to lead through the Dean and Director, the President, and the Regents. While this first great need of segregation of larger groups is important, specialization is no less important. A second general development is therefore essential. The divisional organization as existing at present provides for the handling of groups of subjects. With advancing specialization of knowledge and experimentation each division must expand and enlarge. An organization must be adopted which will encourage and hold men who wish to engage in closer specialization, since it is by such men that new facts and principles are developed. The Division, therefore, must organize into sections and subsections, if necessary, at the head of each of which men of ability can find both position and remuneration sufficient to make their stay at this institution an attractive proposition.

Salary schedule.—There is a constant demand from all parts of this country and from many foreign countries for trained teachers and investigators in Agriculture, and high salaries are offered. A large number of our Faculty, about one quarter, in the past two years have gone to other institutions or into commercial work. The most urgent need of the Department of Agriculture for the next two years is general support and strengthening of the teaching staff along two lines: First, adequate increases for those men whom the Department can not afford to lose; second, additional help in all lines to enable the Department properly to do the work which the agricultural interests of the State rightfully demand. Classes of from eighty to one hundred in such subjects as Cooking, Sewing, Carpentry, Blacksmithing, etc., are too large to accomplish the best work; not more than from twenty-five to forty can well be handled in one section.

Members of the Faculty ought to be given an opportunity to pursue personal study in order to keep abreast of the scientific world. Under the conditions existing in this Department it is impossible to set aside the summer months, in all cases, since the Experiment Station work is particularly urgent at this time. The best solution of this problem lies in the establishment of the quarter system, allowing members of the Faculty one quarter of each year for special study. Three things are therefore necessary in establishing a schedule which will not only attract good men, but which will keep them: First, an increased salary schedule; second, additional help, and, third, a nine months', or equivalent, basis to allow men to keep up with the rest of the scientific world by personal outside study.

Additions to Faculty.—In addition to the demands of the salary schedule, other necessary requirements of growth and change, affecting the Faculty, are pressing. There is needed a more marked segregation of the School and College Faculties, which will require additional help in instruction. The interests of the State demand the expansion of certain lines of work, the reorganization of other lines, and the inauguration of new lines. The educational interests demand the expansion of the work in Agricultural Education and Home Economics, while the agricultural interests require special support in bacteriological research, the soil survey and chemical work, and the animal pathological laboratories.

Land.—The question of additional land for experiment station purposes is acute at the present time. The Station at St. Anthony Park comprises 540.8 acres, of which 123.65 acres are rented. Several tracts of privately owned land exist inside the Station boundaries, causing considerable inconvenience in the handling of the land. The purchase of these enclosed tracts, and of part of the rented land, would give 691 $\frac{3}{4}$ acres. The present and the proposed arrangement, distribution, and use of the land is shown on the accompanying charts. It is strongly recommended that the additional land, viz., 274.6 acres, be purchased as soon as possible. The cities are fast closing in on this land and the prices are rising rapidly. Its estimated value is now about \$220,000. The use of the land by the Station and College may be made to pay a large return on the investment aside from the educational value and the increase in the value of the land.

Map A shows the present University Farm consisting of:

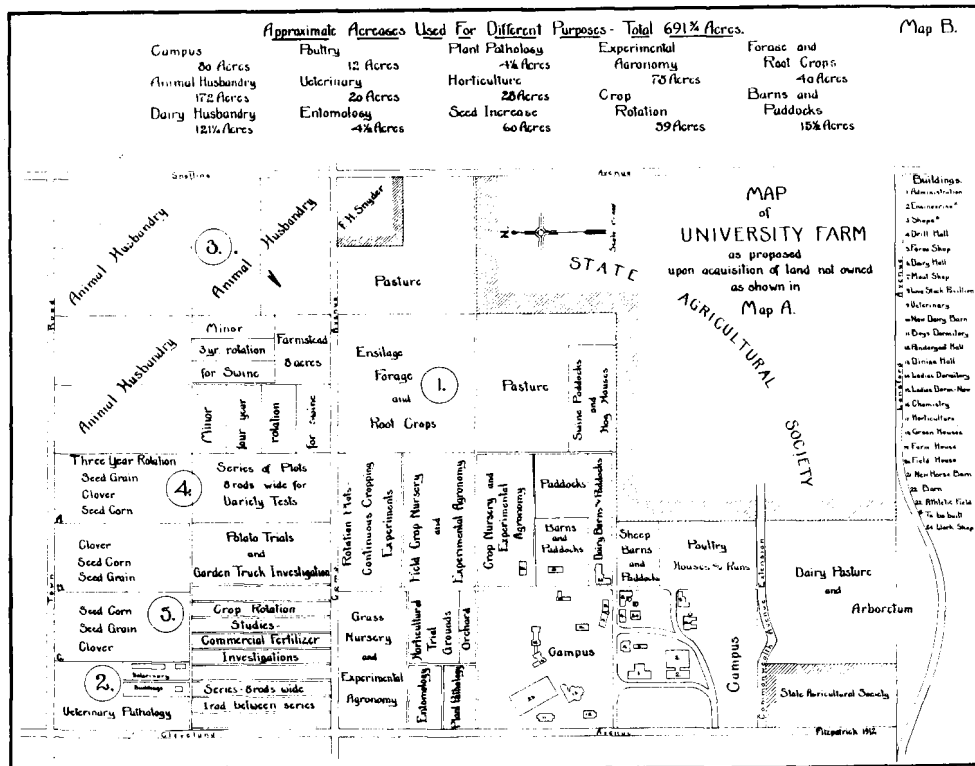
1. Land owned by the University.....	417.15 acres
2. Land rented by the University.....	123.65 acres

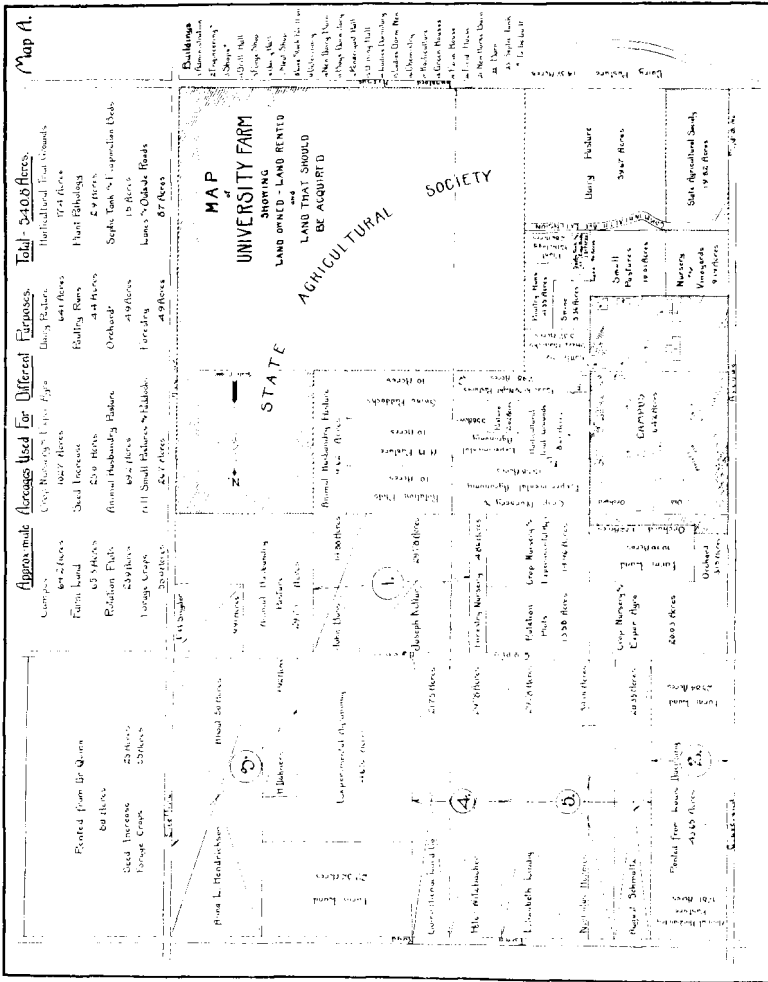
Total.....	540.80 acres
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3. The State Agricultural Society's Grounds.

It also shows land that should be purchased by the University, as follows: (1) The Bass & Keller tracts, 44.66 acres; (2) the Duensing tract (now rented), 43.65 acres; (3) the Hendrickson & Dahners tracts, 59.92 acres; (4) the Como Avenue Land Company and Wiltzbacher tracts, 51.53 acres. Total 254.12 acres. The tracts that should be purchased are indicated in the order of desired purchase by the encircled numerals. This land is needed for the purpose of furnishing adequate experimental grounds, and for farm management and demonstration farm purposes. It is constantly increasing in value and should be purchased at as early a date as possible to avoid higher cost.

Map B shows the proposed plan of University Farm when the land has been purchased, and in the upper margin the acreage of land to be used for different purposes. One hundred and sixty acres is proposed for Animal Husbandry purposes, providing largely pasturage and forage crops. It would also provide suitable yards for feeding experiments and other Animal Husbandry work.





Buildings at University Farm.—The growth of buildings in recent years has not kept pace with the growth of the agricultural institutions which they house. There is urgent need, first of all, for more classroom and laboratory space, and more greenhouses for experimental purposes. In order properly to provide for the work of the Department as it exists and without taking into account the probable rapid growth of the next few years, the following buildings are needed:

1. Home Economics Building.—A new building to take care of all of the sections directly concerned in this work, including physical training for women, is necessary. The importance of the Home Economics course for girls can not be overestimated. A general demand is arising among the women of other colleges for courses in this line of work. A new building will prevent unnecessary duplication of apparatus and instruction, as well as provide adequate space for those at present registered.

2. Drill Hall and Gymnasium.—It will be necessary to provide adequate drill quarters in a new building. The U. S. War Department has found our facilities inadequate, and there is danger of our losing considerable federal support if this lack of proper drill quarters is not remedied. The erection of a new Drill Hall and Gymnasium will make it possible to provide for physical training of men and women as well as for drill, and on the whole will be more satisfactory than using the Live Stock Amphitheatre for drill and erecting a gymnasium. The present Drill Hall is utterly inadequate. The entire building is only 74 by 100 feet, and has almost no bath facilities. It is expected to provide for over 800 school students and 400 college students. Physical training is most urgently needed, not so much from the standpoint of recreation, which nevertheless is important in that it deters many students from less profitable pursuits of amusement, but from the standpoint of the health of the student. This is particularly applicable to students in the Department of Agriculture, whose summers are spent in hard outdoor work and who need physical exercise throughout the year in order to keep in proper health.

3. Enlargement of Power and Heating Plant.—We have added equipment and exchanged smaller units for larger ones in the present power plant to meet the demands as they have been put upon us. We shall have by October 1st, 1,100 h. p. capacity in boilers and 200 k. w. in power capacity. We have reached our limit of expansion within the small power house planned sixteen years ago for a 500 h. p. capacity. We are crowded beyond the factor of safety, when one stops to consider that the institution is dependent upon this small plant for its light, heat, water, and power. The safety of the institution demands a new plant and up-to-date equipment. We can get this new plant by a complete overhauling of the present plant, and by the addition of from 80 to 100 feet at the south end of the present plant. Some of our present boilers and power equipment could be used for the summer run, but from October to April the demands on the power plant will undoubtedly grow to double its present capacity, and an up-to-date plant in every respect should be installed.

4. General Sciences Laboratory.—In order to relieve the overcrowded conditions in the Administration and Horticultural Buildings several divisions should be moved to new quarters. This is especially true of the Horticultural Building, where the crowding is so great as to be positively a menace to the safety of students. The Divisions of Plant Pathology and Forestry should be moved, leaving the Horticultural Building to the Division of Horticulture. The removal of the Division of Entomology from the Administrative Building would furnish needed space for some classrooms and the expansion of the Extension and Library Divisions. While we are not asking this year for this laboratory, the fact is that we need it badly.

5. Detention Hospital.—A building is imperatively needed for students who have contracted a contagious disease or who are held for further examination in suspected cases. Ordinary hospital facilities are obtainable at the Elliot Memorial and City Hospitals, but no proper protection or provision is made for contagious or suspected cases. It is of utmost importance that the 600 students in the dormitories be protected as fully as possible. There is an almost constant coming and going of students attending the different courses in the Department and outbreaks of contagious diseases are inevitable every year.

6. An Agronomy and Farm Management Building is needed to relieve the crowded condition in the Administration Building, and to furnish proper space and facilities for this important work.

The following small buildings (costing approximately \$25,000 each) are needed: greenhouse ranges, cold storage plant, seed house. In addition, a number of small buildings and additions to old buildings for various purposes are needed: horse barn, field house for Plant Pathology, storage cellar, laboratory addition to the Dairy Hall, various small buildings and improvements for a new Animal Pathology plant, alterations in the Veterinary and Chemical Buildings and in the Dining Hall.

NORTHWEST SCHOOL AND EXPERIMENT STATION AT CROOKSTON

Northwest Sub-Station.—The Northwest Experiment Sub-Station was established in 1895 at Crookston, Minnesota. Previous to that time there was no systematic work done in the northwestern part of Minnesota to procure definite and reliable data concerning the agricultural problems and possibilities of this section. The land secured for the Sub-Station was very low. The great problem of proper and adequate drainage was the most important early difficulty here as in many other localities. The Sub-Station at Crookston was designated by a legislative enactment, carrying an appropriation of \$8,000, as the place to carry out a complete series of investigations and experiments regarding surface and tile drainage in the Red River Valley. The drainage system was completed in 1909. Other important objects of this Station were to determine proper rotations for the Red River Valley; to devise plans to combat weeds and

insects injurious to the fullest agricultural development here; to carry on practical demonstration work in dairying, in live stock and in poultry raising; to seek definite data on tree and orchard growing in this prairie land; and to develop and encourage the use of such varieties of seed grain as proved to be the best for this section. Up to within a very few years ago the work done by the Station was accomplished under great difficulties. The farm was low and wet. Consistent results were impossible under these conditions. A great deal was done in conducting farmers' meetings and in advising farmers of the best methods of farming. Definite results from the farm were delayed until in 1909, when the drainage system was installed. A statement regarding the condition of the land of the Station is found on pages 3 to 6, Bulletin 110, University of Minnesota, Department of Agriculture.

Northwest School of Agriculture.—The Sub-Station was established in response to a demand for accurate data regarding the most successful farm methods adapted to this section of the State. In 1905 a movement was begun to secure for this section a school where the boys and girls could be given a practical training similar to that which the parent school at St. Anthony Park had been giving to hundreds of young people from Minnesota farms. The demand came for two reasons: first, because agricultural conditions in the Red River Valley differed radically in many respects from those prevalent in the southern part of the State. The problems arising here required a corps of specialists who knew these conditions and could successfully explain them. Second, because of the distance from the parent schools which prevented many from this section from attending the central school. It was thought that many would become interested in agricultural training and avail themselves of the opportunity of attending a school located nearer the homes. A small appropriation (\$15,000) was granted in 1905 for a building, but no funds were provided for maintenance. Upon completion of this building in 1906, a group of interested citizens of Crookston and vicinity undertook to raise money to maintain the School its first year, 1906-7. Twenty-five thousand dollars was secured for that purpose. Thirty-one students, all that could be accommodated, were enrolled. It was a small but enthusiastic student body. Superintendent William Robertson was the guiding spirit, and from that time on no one doubted the need of the School nor that it would fill an important place in the development of agriculture and of homes in northwestern Minnesota.

Present status.—The farm consists of 480 acres owned by the State and 160 acres owned by the Great Northern Railway Company, but used by the State without charge. Buildings and barns have been provided. They are of simple construction and low cost. There are now the following farm buildings, constructed in the year specified and at the cost designated: Farm House, 1895, \$3,000; Poultry House, 1897, \$1,000; Horse Barn, 1901, \$6,500; Superintendent's Residence, 1905, \$3,000; Machinery Shed, 1905, \$500; Dairy Barn, 1905, \$2,500; Root Cellar, 1909, \$1,000; Slaughter House, 1909, \$1,000; Swine Barn, 1909, \$1,500; four cottages for Station men, 1911, \$10,000; Sheep Fold, 1911, \$1,500; addi-

tions to Farm House, 1911, \$1,500; to Superintendent's Residence, 1911, \$900; to Barns, 1911, \$4,000; to Poultry Houses, 1911, \$2,000; Silos, 1911, \$500.

The School is located in the northwest corner of the farm and is two miles from the center of the city of Crookston. Six brick school buildings have been provided up to the present time, as follows: School Building (now Home Economics), 1905, \$15,000; Stephens Hall (Boys' Dormitory and Dining Hall combined), 1907, \$50,000; Mechanical Building, 1907, \$15,000; Administration Building (includes an auditorium and gymnasium), 1909, \$40,000; Girls' Dormitory, 1909, \$25,000; Science Building, 1912, \$40,000; addition to Mechanical Building, 1911, \$10,000; various items, as spur track, alterations and repairs, sidewalk and curbing, grading and grounds, well and pump, water works system, and trees and shrubbery, 1911, \$12,990.

A school of this type possesses unusual advantages for the work to be done. The farm herds, buildings, machinery, equipment, field work, management, and products are available as a basis of the instruction and demonstration work that is carried on. The School offers a practical course to the boys and girls who are to be the future farmers and homemakers in this section. The local administration of the farm and the school is centered in one person, enabling him to organize the work and equipment to the one end of furthering the education planned. There are several important phases of agricultural work and instruction that have, through lack of means and equipment, been neglected. In a later portion of this report those items are considered fully. At the present time the majority of the students in the regular school course come directly from rural schools. An increasing number each year have had some high school training. To meet the needs of these students the school course will gradually develop into a strictly technological course in agriculture with a grade of work more advanced than that now being given. The aim is to train for rural life leadership, which includes a knowledge and appreciation of the social, as well as the economic, phases of country life. The graduates of the School create a distinct investigational atmosphere in their respective communities. Fully 85 per cent are on farms and in farm homes where they both consciously and unconsciously are putting into practise principles they learned during their school course.

Changes in the last two years.—The present superintendent of the School and Station was appointed in 1910, beginning his work on August 1st. The farm drainage system had been installed the year before, making possible the planning of a series of experiments, demonstration and investigational work for the ensuing years. The School had grown to number 129 in 1909-10. Two new buildings were completed in 1910, enabling a larger number to attend the School. A plan of departmental organization was begun with a station worker, who was also an instructor in the School, at the head of each department. A complete system of farm records was begun and systematic reports were required of each important project.

In 1912 the inspection of the "Summer Practicums" work of each

undergraduate was begun. This consists of assigning to each undergraduate specific farm problems to be worked out on his home farm during the two summers that intervene between the student's entrance into, and graduation from, the School. This work is a regular part of the course and bears a credit. The increasing demands made upon the School and Station workers outside of the School in the various communities of this section of the State during the past two years are significant, as they point to what the future will require to be done. One hundred and twenty extension appointments were filled by members of the staff during the past year only.

The superintendent, as president of the Red River Valley Dairymen's Association, and as vice-president of the Northwestern Minnesota Agricultural Society, is actively engaged in promoting the objects of these organizations. A movement to place county agricultural experts in each county of this section of the State is progressing satisfactorily. The organization of the Polk County Pure Seed Association, with the Station Agronomist as secretary, was accomplished at the Farmers' Short Course held at the School January last. Similar associations will be organized in every county of this section during the coming year.

The organization of a summer training school for teachers conducted in connection with the State Department of Education was perfected in 1911, when 148 teachers were enrolled for a six weeks' course held at the Agricultural School. In 1912, 216 teachers from six counties joined together for this purpose, were enrolled. All of the regular School Faculty conducted classes in these summer sessions.

In 1911 the first Farmers' Short Course and agricultural exhibit was held at the School. This course evoked much enthusiasm and was very successful. In 1912, in spite of the coldest weather of the winter, a large number of farmers attended the second Short Course. This course has become a permanent feature of the School and Station work of this institution. It serves as a meeting place for several allied organizations and will become, in the near future, a leading force among northwestern Minnesota farmers. In 1912 the first Junior Short Course for boys and girls was held at the School. This will be a permanent course with an increasing attendance when its purpose and aims become more fully known.

The superintendent was elected chairman of the 1912 University Week Committee and found it an easy and agreeable task to interest both farmers and city people in the rich and attractive course of lectures and entertainments provided during that week. Another significant event took place in 1912 when the rural school graduates of Polk County, 66 in number, had their eighth grade graduating exercises at the Agricultural School. A movement has been begun to have all the graduates of several northwestern Minnesota counties assemble at the School during the summer session for a combined graduation exercises and field day, at which time a number of highly instructive and interesting demonstrations will take place.

There have been numerous changes in the Faculty during the past two years. Of the Faculty two have been here longer than that period,

having been connected with the institution six years. In 1910-11 seven members of the Faculty resigned and, in addition to the appointments to fill these vacancies, five new appointments were made: one each in Animal Husbandry, Farm Mechanics and Superintendency of Buildings, Home Economics, and English.

There have been a few minor changes made in the regular school curriculum of the schools during the past two years. The course in Agronomy has been strengthened. A course in Farm Management has been added. The courses in Home Economics have been broadened. The work in Veterinary Science has been simplified to make it of more direct value to the students. An elementary course in gasoline engine work was begun in 1911 when the room in the addition to the Mechanical Building was completed. The work in Animal Husbandry was offered in 1911, when the newly appointed instructor of that branch was added to the Faculty. In general, the work of all the departments has been greatly strengthened through the acquisition of better instructors, classrooms, and laboratories. Public speaking practise in connection with Literary Society work has been given greater prominence the past year.

No additional land has been acquired during the past two years. The cultivated area of the farm has been increased to include all but one field of 30 acres east of the Northern Pacific tracks which is still in original prairie sod. One hundred and twenty acres of prairie sod have been broken the past two years. In 1913 the entire farm will be under cultivation. In 1911 the farm was divided into two parts; the land west of the Northern Pacific tracks and south of the school campus, about 250 acres, was divided into five fields, for a major five-year rotation demonstration; the land east of the Northern Pacific tracks, about 210 acres, was divided into seven fields, for a major seven-year rotation demonstration. Up to 1911 no systematic rotations had been followed due to the lack of proper drainage of all parts of the farm. Diagrams showing these rotation series are on file in the Dean's office. Fences have been built. Fields have been handled as carefully as time and means would permit. The 1911 crop was the best the farm ever raised. The 1912 crop, just before harvest, promised to excel the 1911 crop. Progress is being made in beautifying the borders of the farm, of the drainage ditches, and of the fields. In the past these places have grown many noxious weeds. In the near future the entire farm will be absolutely weed free. About 30 acres of the section of land are used for experimental and demonstration purposes. This land is situated east and south of the school campus, adjoining the farm garden, horticultural plots, and orchard. A windbreak was planted several years ago. The trees are growing nicely. During 1912 between six and seven thousand trees and cuttings were planted according to the new campus plan adopted by the Board of Regents in June, 1911. Elms, ash, hackberry, and other varieties of trees were planted. Several kinds of evergreens were used, as well as shrubbery of various sorts. Within a few years the campus and farm will take on a very attractive appearance.

In a previous section of this report is given the list of school and farm

buildings, in use at the present time. Those provided for by law in 1911¹ with the exception of the new Science Building, have been completed. The Science Building will be completed during October. It was necessary to formulate some definite plan for the location of farm and school buildings. In 1911 a landscape architect was secured who drew up the present plan. It was necessary to move some of the farm buildings to provide a suitable campus that would be large enough for the future needs of the institution. The season of 1911 was practically given up to making these changes. They necessitated laying out new roads, new walks, new water mains, new surface ditches, new boulevards, and new lawns. All of this work has not been completed up to the present time, but good progress is being made. Additional funds will be required to complete this work. Unfortunately the appropriation for the Science Building was too small to provide a necessary greenhouse for the work here. Several other minor buildings are needed. If the School is to care for the increased number of students, a new boys' dormitory will be needed next year.

The most important problem that is being investigated here is the drainage problem. The other large problems are the major crop rotation demonstrations, making the state farm a pure seed center for north-western Minnesota, investigating the advantages and disadvantages of using a gasoline tractor on a section of land, live stock and dairy herd feeding and management, the use of fertilizers on the large fields of the farm, alfalfa experiments, poultry keeping, horticultural and forestry work, cost and observations of two types of silos, and a number of plot demonstrations and experiments. These experiments, excepting one alfalfa experiment, were begun during the past two years. The variety testing work is of special importance to this portion of the State. In all about 130 varieties of corn, flax, wheat, and barley are being tested. The most successful will be sowed on the larger fields of the main farm. Our sales of pure seed during 1912 were considerable (about \$2,750). A pure seed center is urgently needed in this section of the State. If this Sub-Station may be properly equipped and manned to carry on the work efficiently, this pure seed work will make the farm self-supporting.

Educational statistics.—Table IV shows the registration for the last six years in the regular course of the School. The Northwest School was organized in 1906.

TABLE IV. REGISTRATION, 1906-12

	Boys	Girls	Total
1906-7.....	13	8	31
1907-8.....	32	9	41
1908-9.....	78	23	101
1909-10.....	97	32	129
1910-11.....	108	32	140
1911-12.....	121	39	160

Farmers' Short Courses have been held with an attendance of 125 in 1911 and 98 in 1912. The latter was held in very severe cold weather. Teachers' Training School Courses were held in 1911 (attendance 148) and in

1912 (attendance 216), and a Junior Short Course with 21 students was held in 1912.

Table V shows the number graduated since the beginning of the School.

TABLE V. DEGREES GRANTED, 1909-12

	Boys	Girls	Total
1909.....	6	3	9
1910.....	5	4	9
1911.....	6	9	16
1912.....	13	10	23
			57

About 50 per cent of the students in all of the courses in the Northwest School reside in Polk County. For the year 1911-12 the students were distributed as follows:

Regular course: Polk, 86; Marshall, 22; Kittson, 10; Red Lake, 4; Roseau, 9; Itasca, 5; Norman, 11; Becker, 10; Clearwater, 2; Ottertail, 1. Total, 160.

Farmers' Short Course: Polk, 63; Marshall, 9; Kittson, 7; Red Lake, 3; Roseau, 3; Itasca, 2; Norman, 9; Becker, 1; Ottertail, 1. Total, 98.

Teachers' Course: Polk, 118; Marshall, 29; Kittson, 22; Red Lake, 26; Roseau, 1; Itasca, 2; Norman, 7; Beltrami, 1; Clearwater, 6; Koochiching, 4. Total, 216.

Junior Course: Polk, 14; Marshall, 5; Red Lake, 1; Itasca, 1. Total, 21.

Needs and recommendations.—The schedule of salaries paid to the instructors here is wholly inadequate if we are to carry on first-class School and Station work. An increasing amount of transient labor will be needed for the experimental work of the farm and the campus and school grounds work, but there will be no great increase in the number of instructors. In addition an increase will be necessary in administrative and operative expense.

A new central heating plant with water softener is very urgently needed, not only in the interests of efficiency, but in the interests of safety. A boys' dormitory ought to be built very soon in order to avoid the excessive crowding which is already necessary. Another item of urgent need is the construction of a sewer from the School to the river. The following minor buildings and improvements are also needed: greenhouse, grain storage and cleaning building, cottages for station workers, machine shed, and swine barn addition.

WEST CENTRAL SCHOOL AND EXPERIMENT STATION AT MORRIS

History and present status.—The 1909 session of the Minnesota Legislature accepted from the National Government the gift of the property formerly used as an Indian School, and appropriated funds for its maintenance as an Agricultural School. The control of the institution was placed under the Board of Regents of the University of Minnesota. The

first school year opened October 3, 1910, with courses similar to those of the School at St. Anthony Park. The Faculty for the year 1910-11 included a superintendent and six instructors. Three instructors were added in 1911. A farm foreman, a librarian, and a matron were also added. A curriculum has been adopted similar to those of the previously established Schools of Agriculture; it has not yet, however, been completely organized.

The original farm comprised 292 acres. The following tracts are rented: fifty-five acres from L. C. Spooner, ten acres from George Darling, and seven and a half acres from the Cemetery Association.

At the time of the opening of the School the following buildings, with the estimated value of each, were in the grounds: Office, \$15,000; Agronomy, \$12,000; Home Economics, \$12,000; Dining Hall, \$20,000; Laundry, \$4,000; Hospital, \$10,000; Cottage, \$2,500; Warehouse, \$1,500; Ice house, \$100; Morgue, \$200; Machine shed, \$50; Barn, \$2,500; Silo, \$450; total, \$80,300. Since June, 1911, a number of changes have been made. The Office has been remodeled, giving an entire wing for library and reading room. In the Home Economics Building walls have been removed and others put in, giving a model dining room, classroom and cooking laboratory on the second floor; two classrooms and a sewing room on the first floor. The Dining Hall, Hospital, and Cottage have all been repaired, but no extensive remodeling has been done. The warehouse and machine shed have been torn down. The nails have been removed from all boards, and practically all the lumber can be used again. A foundation was placed under the ice house, and the building repaired. The "morgue" has been remodeled to make a storehouse for poultry supplies. No changes have been made in the barn other than the addition of swinging stanchions for the cows and the removal of the horse stalls, as a new dairy barn is being planned. A special appropriation was made for a Girls' Dormitory, and this building is practically completed. Work on the Boys' Dormitory is progressing rapidly and it is expected that this building will be completed by November 1st. The central heating plant, heating system, and water softener, have all been completed. The horse barn, machine shed, hog house, and poultry house were all built partly of new and partly of old lumber from the farmer's cottage. A blacksmith shop was made from bricks from old chimneys and foundations and given a coat of concrete. The roof, too, was made of old material, so that the main item of cost for this building was labor. It provides ample working room for eighteen boys at one time.

The experimental work of the Department of Agronomy during the past season has been conducted along two principal lines; first, the adaptation of corn and small grains to meet more fully the needs and requirements of the soil and climatic conditions of this section of the State; second, the application of systems of crop rotations to the farms of this section. This season the more important varieties of small grain were put into variety test plots, from which selections will be made and the more promising strains continued with the purpose of improving our

standard varieties in yield, quality, and disease resistance. Corn-breeding experiments have been started with Minnesota No. 13 corn to fix more fully the breed type characteristics and adapt it to this section of the State. The more important varieties of corn are also being tested both at the Station and in co-operative tests with farmers, to determine their adaptability and usefulness for this section of the State. At the present time this section of the State is changing from grain farming to more diversified forms, and one of the most fundamental problems is the adaptation of the farm to a definite system of crop rotation. This problem is being taken up both from the practical and experimental standpoint. Various plot experiments have been started to determine the value of different systems of, and the effect upon, the fertility of the soil. These experiments will be permanent and the results will increase in value as the data accumulate from year to year. One hundred acres on the general farm has been laid out in a five-year rotation to demonstrate from a practical standpoint the value of clover and diversified farming. A dairy herd will be maintained in connection with this rotation. Besides these main lines of experimental work co-operative experiments with alfalfa, corn, and wheat have been conducted in conjunction with the Central Station. One of the main projects for this year is the promotion of the organization of local extension work through the co-operation of the National and State Departments and Grain Exchanges and the West Central Minnesota Development Association. County demonstrators will be placed in most of the counties in our district. These men will visit farmers and help them to re-direct their work; they will organize clubs and take surveys. The rural schools can be so helpful in the general movement for agricultural betterment that a plan is being perfected whereby the institution can conduct a three months' summer session for rural teachers. The main emphasis on this work will be agricultural so as to give the prospective teachers both enthusiasm and a knowledge of the work they are to handle.

Educational statistics.—In 1910-11, 103 students, and in 1911-12, 93 students were registered. (The difference in the number of registrations is easily accounted for by the fact that during the first year nineteen former students of the Morris city schools entered, remained for periods varying from one to three months, and did not return the second year.) These 93 students were distributed as follows: From counties in Minnesota, Stevens, 51; Pope, 21; Swift, 8; Bigstone, 6; Kandiyohi, 2; Lac qui Parle, 2; Freeborn, 1; Saint Louis, 1; from Iowa, 1; North Dakota, 1. The first class was graduated in the spring of 1912 and was made up of five boys, all sons of farmers and all returning to their home farms. Two of them have taken charge of the home farm and the other three have assumed active part in the management of their farms.

The School and Station are gradually taking their place of leadership in west central Minnesota development. There has been some trouble in getting outside communities to realize that the institution is to cover the prescribed area. However, we are receiving students from at least ten counties, and the influence of the institution is being felt in at least

a total of fifteen counties. It is the policy of the supervision to get acquainted with people in every locality so that they will be able to direct students to our School and to connect the work of the institution with the problems of the respective vicinities.

Special needs and recommendations.—It is desired to work out the department organization more fully with capable men and women at the head of the various divisions who will be responsible entirely for the success of their respective fields of work. It is also hoped that the new organization of the extension work through county and district men will make it possible for the Faculty to give more attention to classroom work. A better organization of the office will also assist in the general improvement of the School. In addition to the force now employed we shall need a Department of Horticulture, covering work in orcharding, vegetable gardening, forestry, and landscape architecture. We shall also need a Department of Rural Social Science, including studies in history, geography, government, economics, and sociology. The curriculum during the next few years should be extended to include at least two years more of work. A rural school teachers' training course should be perfected as soon as possible, giving special attention to the needs of the rural school work. This may be organized at present as a three or four months' session, using the plant at a time when it would otherwise be idle.

The present experimental and demonstration projects will be continued. To these will be added others that have special reference to the needs of west central Minnesota. As the departments are not yet fully organized, it will be impossible to outline this work at present.

As soon as possible title should be obtained to the Spooner tract that is now being rented. The quarter section across the river should be disposed of and the proceeds used to obtain land nearer the Station. A number of small buildings and additions to old buildings will be needed in the near future. Important among these are the following: cow barn, pressure tank, and a laboratory for Agronomy and Horticulture. A dining hall, including a gymnasium and auditorium, ought to be built within the next few years. Our present dining hall is limited to a capacity of about 125 people. We have dormitory space for 175. Moreover, the dining hall is an old wooden structure with insufficient and unsanitary kitchen room. Should it catch fire, it would greatly endanger the Administration and Agronomy Buildings, and also the Boys' Dormitory. A considerable item for repairs and rebuilding is also advisable. We have old lumber on hand which can be profitably utilized in this way.

NORTH CENTRAL EXPERIMENT STATION AT GRAND RAPIDS

The work of the Station during the past year has been largely a continuation of the work of the past seven years, which is a working out of a system of practical farming for the timbered section of northern Minnesota, and the introduction of this system among the farmers. The grow-

ing of field crops has resulted in a three-year rotation, which from present indications seems the most profitable for the small farms of this section of the State. This rotation is as follows: grain followed by clover; clover followed by a cultivated crop, viz., potatoes, corn, field roots; after the cultivated crop the fields are again seeded to grain. All the small grains are grown successfully, though oats give the most profitable returns. Field peas yield well on clay soil, but are not generally successful on sandy soil. In forage crops, corn as fodder gives a greater yield per acre than millets or any of the forage grasses that are extensively advertised. Potatoes have proved to be the most profitable crop to grow for market. Manure seems to give the best results when applied as a top dressing on the fields seeded to clover. In the test of varieties of corn for grain Minnesota No. 23 matures the earliest, with Northwestern Dent a close second, the latter being best for fodder. In potatoes nothing has been found to excel the Carman No. 1, a variety which has been grown as the main field crop on the Experiment Farm for eight years. In oats no variety has been found superior to Improved Ligowo which has also been grown for a number of years on the Experiment Farm. In barley Manshury has been the largest yielder. Beardless and hull-less varieties have not been satisfactory in yields. Speltz has not been equal to barley in yield.

In live stock, dairying is given special attention. A study is made of the profits in dairying under a practical system of farming, of the improvement made through using a registered dairy sire on common stock, of the difference in production in individual animals, and in the most economical feeds. The dairy herd at the present time consists of 106 animals, 89 of which are females. The large Improved Yorkshire hogs are raised in connection with the dairy to utilize the skimmed milk. As mentioned in the 1911 report the Poultry Department has been enlarged and is now located on a separate part of the farm, and being run on a financial basis with a poultryman in charge. Barred Plymouth Rocks and Single Comb White Leghorns are the breeds kept. The capacity of this Department will be from 800 to 1,000 hens.

The extension work of the Station was increased as far as possible during the past year both by farmers' meetings and correspondence. Special assistance was given to co-operative work and to the distribution of pure seed.

THE NORTHEAST DEMONSTRATION AND EXPERIMENT FARM AT DULUTH

The State Legislature in 1911 authorized the appropriation of \$65,000 for the purchase of a Demonstration and Experiment Farm at or near Duluth. During the summer of 1911 the S. E. $\frac{1}{4}$ and the S. $\frac{1}{2}$ of the N. E. $\frac{1}{4}$ of Section 25, Township 51 N., Range 14 W., containing 240 acres, owned by the Greysolon Farms Company, was selected and recommended to the Board of Regents for purchase. Two hundred and thirty-five acres of this land was purchased August 1, 1912, at \$50 per acre. A five-acre tract in the northeast corner of the farm, on which is a small

house and stable, was purchased later for \$1,500. The total tract of 240 acres of land was secured at a cost of \$13,250. The land lies well and is comparatively level. It was covered with a heavy growth of mixed timber. It contains some stone and will need a small amount of drainage. The Greysolon Company contracted to have cleared the N. E. $\frac{1}{4}$ of the S. E. $\frac{1}{4}$ and fifteen acres of the west half of the S. E. $\frac{1}{4}$ of the S. E. $\frac{1}{4}$ at \$65 per acre. The clearing has been completed.

In logging the 55 acres that were cleared considerable good timber was saved and sawed into lumber. There is now on hand 82,053 feet of lumber which cost \$15 per thousand, from which many of the buildings needed may be in part erected. Five hundred fifteen and a half cords of wood were cut and yarded and $187\frac{1}{2}$ rods of ditch have been dug in order to drain the land so that it might be cleared and plowed. On September 1, 1912, a farmer was employed to put the land in order for next year's crop. A part of the land will be disked and seeded to rye this fall and timothy and clover next spring. About 20 acres of the land will be plowed and put into corn, potatoes, and other coarse vegetable and forage crops. The balance of the cleared land will be seeded down as soon as it can be put into shape, with a view to securing some pasture and forage upon which to support the live stock that will be necessary in developing the place. No buildings have been erected upon the place as yet, but arrangements are being made to build a house for the farm manager the coming winter and spring, also a horse barn and machine house and a cow barn. Poultry houses and a milk house or creamery will be erected a little later. A superintendent's house and other buildings will be added as needed.

A superintendent has been employed to begin operations on March 1, 1913. The farm will be developed as a combination dairy, poultry, and truck farm, making it so far as possible a demonstration of the kind of farming that should be conducted in northeastern Minnesota. A working dairy of 30 to 40 cows is to be built up and the most intensive farming possible conducted. Farmers or their children from the northeastern part of the State, who desire to secure practise in the modern methods of farming, will be allowed to come to the farm for work in the various lines of farming established. Methods of farming and varieties of crops will be tested for the purpose of determining the best types and varieties for the vicinity. The superintendent will undertake the management of the farm, co-operating with the neighboring farmers, with the schools, and with the people of Duluth who live on small tracts of land, with a view to building up the agriculture and home life of this section of the State.

THE SOUTHEAST DEMONSTRATION AND EXPERIMENT FARM AT WASECA

By Legislative Act in 1911, \$35,000 was appropriated for the purpose of establishing a Demonstration and Experiment Farm at Waseca. In the summer of 1912 there was purchased from R. P. Ward 246.02 acres

at \$125 per acre. The land joins the city limits on the southeast. The total amount paid was \$30,752.50. A description of the land follows: the S. E. $\frac{1}{4}$ of the S. W. P. of the N. W. $\frac{1}{4}$ and a portion of the S. E. $\frac{1}{4}$ of the N. W. $\frac{1}{4}$ and a portion of the N. E. $\frac{1}{4}$ of the N. E. P. of Section 18, Township 107 N., Range 22 W.

The buildings on the farm are in only fair condition and will need to be altered and repaired. They consist of a farm house, milk house, poultry house, machine shed, a large barn, granary, ice house, corn cribs, horse barn, and well house, with engine, water tank, and windmill. The machine shed will need to be torn down as it is ready to fall. Some of the other buildings will need to be moved. A new farm house should be erected as the old one is not worth repairing. Some cattle and swine feeding sheds and silos will also be necessary. A good drilled well is on the farm but the water should be piped to the various buildings. Some tile drain has been laid on the farm, but the system of drainage should be extended. The farm has been surveyed by the Engineering Division and the preliminary levels taken for the drainage system. The plans for drainage are to be completed as soon as possible. As the land was in crop when purchased, no work has been attempted in 1912. Arrangements have been made with the former owner to do the plowing this fall. The farm will be equipped and a manager put on in the spring of 1913. It is planned to develop the farm along practical lines as a live stock farm. A good herd of beef cattle, 20 to 25 Holstein cows, and a good herd of swine will be maintained. The farm work will be done by Percheron mares. Special attention will be given to the production of corn, oats, and barley for seed. The farm will be made to demonstrate the value of good management, and, so far as possible, practise in farming will be given to those wishing to learn. The superintendent will co-operate with the farmers in the vicinity in the management of their farms and with the schools and other organized bodies in the development of the agriculture of this section of the State. The farm will be made to serve as a University center for the dissemination of knowledge regarding farm life.

Respectfully submitted,

ALBERT F. WOODS, *Dean*

THE LAW SCHOOL

To the President of the University:

SIR: I herewith present a report of the Law School of the University.

Historical.—The Legislature of the Territory of Minnesota in the act providing for the establishment and organization of the University of Minnesota, passed in 1851, provided for a department of law.* In 1862 the Legislature of the State made further provision for the establishment of a College of Law.† But it was not until January, 1888, that the Regents took the first step in establishing such a college by electing William S. Pattee as Professor of Law and Dean of the College of Law. The work of instruction was begun in September, 1888. Dean Pattee, the only resident professor, was assisted by certain lecturers selected from the bar of St. Paul and Minneapolis. From the very first, Dean Pattee held classes at night for the convenience of those young men who desired to study law, but whose employment prevented their attendance upon the regular day classes. From this beginning was developed the night school of the College of Law. At the beginning the course of instruction extended over two years in both day and night schools. In September, 1891, an additional or third year's work was offered leading to the degree of Master of Laws. In September, 1892, the evening undergraduate course was extended to cover a period of three years. In September, 1895, the day course was increased to three years. In 1907 the evening course was further extended to cover four years. In 1897 a graduate course of two years, leading to the degree of Doctor of Civil Law, was established. Thirteen students appear to have been matriculated for this course during the year 1898-9; but as few students in subsequent years offered themselves for the course it was withdrawn.

Entrance requirements.—At the time of the establishment of the Law School in 1888, no other educational requirements for admission were made than that the applicant should have such a general education as would enable him to pursue the study of law with advantage to himself. In September, 1892, students not graduated from a high school or institution of higher learning were examined in certain elementary subjects; but persons who could not pass such examinations were admitted as special students not candidates for a degree. In September, 1895, applicants for admission as regular students were required to qualify for admission to the freshman class of the Academic College of the University. In September, 1901, admission to regular standing was substantially limited to graduates of a high school. In 1909 the applicant

* See General Statutes, 1849-1858, Chapter 23, Section 10.

† General Statutes, 1862, Chapter 1, Section 2.

for admission to regular standing was required to have completed the work of one year in the Academic College of this University or some other institution of equal grade, and in 1911 this requirement was increased to two years of college work.

Attendance.—The attendance upon the Law School, beginning with 67 during its first year, steadily increased until it reached a maximum of 614 in 1908-09. The attendance of 1908-09 exceeded that of the preceding year by 123. This was due undoubtedly to the desire of students to escape the increased requirement of one year of college work that went into effect September, 1909. In the year 1909-10 the attendance dropped to 462, being 142 less than the maximum. The effect of increasing entrance requirements upon the attendance of the Law School is strikingly shown by a comparison of the successive annual registrations in the first-year class. In September, 1908, 204 men registered in the first-year day class, being evidently moved by the desire to enter upon the high school basis. In September, 1909, the entering day class qualifying under the requirement of one year of college work numbered only 69. The entering day class of September, 1910, under the same requirement numbered 79, while that entering in September, 1911, under the requirement of two years of college work, dropped to 23.

Faculty.—From the establishment of the Law School in 1888, Dean Pattee was the only resident professor until 1896, when James Paige and A. C. Hickman were made Professors of Law. Henry J. Fletcher became Professor of Law in 1902, and Robert S. Kolliner, in 1909. H. E. Willis was made Instructor in Law in 1901, and six years later, Assistant Professor of Law. Henry S. Mitchell was appointed Instructor in 1909, but resigned in 1911. Wm. G. Graves was appointed Instructor of Law at the beginning of the present session. Dean Pattee died in April, 1911, and Professor Robert S. Kolliner, after a year's leave of absence on account of illness, resigned in September, 1912. In September, 1911, Professor Edward S. Thurston, then Professor of Law at the University of Illinois, was elected Professor of Law in this Law School. Professor A. C. Hickman was retired on the Carnegie Foundation in 1911, but, upon the disability of Professor Kolliner, continued to discharge the duties of his professorship during the year 1911-12. In August, 1911, William R. Vance was elected Professor and Dean. As he was unable to report for duty during the session 1911-12, Professor James Paige was appointed Acting Dean and served in that capacity during the session. Thus, during the session 1911-12 there were seven members of the Faculty of Law giving substantially all of their time to the work of instruction. In addition to this, special lectures on different topics were given by the following members of the Minnesota bar: Howard S. Abbott, Hugh V. Mercer, Charles W. Bunn, Christopher D. O'Brien, Hon. John W. Willis, Cassius M. Ferguson, Arthur L. Helliwell, Hon. Thomas D. O'Brien, Rome G. Brown, Hon. Edmund S. Durment, Waldron M. Jerome, Charles J. Traxler.

New case books.—With the beginning of the session 1911-12 the reorganization of the Law School was commenced in order to bring its work

more nearly into harmony with that of other law schools in the country. Experience had demonstrated that the series of case books, long in use in the School, possessed certain radical defects which necessitated their replacement with the case books generally in use in other law schools. In order to save the student expense, a custom grew up early in the history of the Law School whereby the University purchased and loaned to students the case books needed in the several courses. In view of the many changes that were necessary, it was thought inadvisable to abolish this custom, although it is believed not to exist anywhere else in this country. As a consequence, the substitution of the new case books in place of those formerly used entailed a heavy charge upon the fund appropriated for the Law Library. During the session 1911-12 the total cost of case books purchased for the use of students was \$2,364.42.

Methods of instruction.—During the year 1911-12 an earnest effort was made to bring the methods of instruction used in the Law School, as well as the arrangement of the curriculum, into closer conformity with those which prevail generally in the leading law schools of the country.

Curriculum.—Prior to the year 1911-12 candidates for the degree of Bachelor of Laws in the day school were required to complete work covering about 1,000 lecture periods, while students of the night school were required to complete about 700 lecture periods. It appears, however, that in some instances the night lecture periods were somewhat longer than those in the day. It had been the practice to take up the several subjects in the curriculum successively, each class pursuing a subject by daily recitations until it was completed. Examinations were then held on each subject as completed. During the session 1911-12 this practice was changed, and the method of carrying several different topics under as many different professors contemporaneously was introduced, with examinations held at the end of each semester. The topics of instruction were so arranged as to require the first-year class to attend fourteen lecture periods each week, while the second- and third-year classes attended twelve lectures each week. Under this arrangement students are required to complete work extending over 1,200 hours in order to qualify for the degree of Bachelor of Laws.

The Night Law School.—In conformity with the action taken by the Board of Regents, students applying for admission to the first-year class in the night law school were informed that they were accepted with the understanding that the night courses, in so far as they led to a degree, had been abolished. The registration of night students for the session was as follows:

	REGULAR	SPECIAL	TOTAL
Fourth Year.....	25	5	30
Third Year.....	16	7	23
Second Year.....	17	7	24
First Year.....	6	22	28

At the time when the abolition of the night law school had been determined upon, it was decided that the second- and third-year classes would be allowed to qualify for their degrees by pursuing the required courses under the supervision of the Division of University Extension. The members of these classes, however, made an earnest request that instruction in the remainder of courses upon which they had entered should be given in the Law Building and under the immediate supervision of the Law Faculty. In April they were assured that this request would be complied with.

Statistics.—Appended hereto are tables and figures showing the successive annual registrations of the Law School from its beginning to the close of the present session (Table I); the geographical distribution of law students residing within the State of Minnesota and without; the conditions, failures, and incompletes given in the Law School during the session 1911-12 (Table II).

TABLE I. REGISTRATION, 1888-1912

YEAR	TOTAL	DAY	NIGHT	GRADUATE	SPECIAL
1888-1889.....	67	...	...	...	...
1889-1890.....	134	...	...	...	...
1890-1891.....	176	...	...	...	...
1891-1892.....	242	165	64	13	...
1892-1893.....	277	176	94	7	...
1893-1894.....	310	184	101	25	...
1894-1895.....	310	199	111	...	...
1895-1896.....	371	221	127	23	...
1896-1897.....	461	195	239	27	...
1897-1898.....	459	267	144	28	...
1898-1899.....	455	280	175	...	...
1899-1900.....	528	337	161	30	...
1900-1901.....	463	289	152	22	...
1901-1902.....	504	286	194	24	...
1902-1903.....	475	278	176	21	...
1903-1904.....	555	255	166	20	114
1904-1905.....	500	254	155	19	72
1905-1906.....	500	273	153	14	60
1906-1907.....	498	257	133	15	93
1907-1908.....	491	273	122	5	91
1908-1909.....	614	347	135	34	98
1909-1910.....	462	265	98	15	84
1910-1911.....	438	248	72	10	108
1911-1912.....	327	137	74	...	116

Geographical distribution.—Students from Minnesota were registered by counties as follows: Aitkin, 1; Anoka, 2; Becker, 1; Beltrami, 1; Bigstone, 2; Blue Earth, 2; Brown, 1; Chippewa, 5; Chisago, 1; Cottonwood, 1; Crow Wing, 3; Dodge, 1; Douglas, 1; Faribault, 2; Fillmore, 1; Freeborn, 4; Goodhue, 2; Grant, 2; Hennepin, 165; Jackson, 1; Kandiyohi, 1; Lincoln, 1; Lyon, 2; McLeod, 3; Marshall, 2; Martin, 1; Millelacs, 1; Mower, 1; Nicollet, 1; Nobles, 3; Norman, 2; Olmsted, 4; Ottertail, 3;

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Polk, 3; Ramsey, 20; Renville, 1; Rice, 1; Saint Louis, 6; Sherburne, 1; Sibley, 1; Stearns, 3; Steele, 2; Stevens, 1; Traverse, 1; Wabasha, 2; Waseca, 2; Washington, 2; Watonwan, 1; Wilkin, 2; Winona, 4; Wright, 1; Yellow Medicine, 2. Students were registered also from the following other countries and states: Arizona, 1; District of Columbia, 1; Iowa, 3; Japan, 1; Kentucky, 1; Massachusetts, 1; Montana, 1; Nebraska, 1; New York, 1; Oklahoma, 1; Oregon, 1; Ohio, 1; North Dakota, 7; Pennsylvania, 1; South Dakota, 5; Texas, 1; Wisconsin, 14.

TABLE II. CONDITIONS, FAILURES, AND INCOMPLETES, 1911-12

	REGULAR STUDENTS	SPECIAL STUDENTS	TOTAL
First Semester:			356
Incompletes.....	13	26	39
Conditions.....	116	115	231
Failures.....	18	68	86
Second Semester:			214
Incompletes.....	4	20	24
Conditions.....	91	60	151
Failures.....	10	29	39

Respectfully submitted,

JAMES PAIGE, *Acting Dean*

THE COLLEGE OF MEDICINE AND SURGERY

To the President of the University:

SIR: I beg to report on behalf of the College of Medicine and Surgery for the year 1911-12.

Historical.—In 1888 the Department of Medicine of the University of Minnesota was organized. It included the College of Medicine and Surgery, the College of Homeopathic Medicine and Surgery, the College of Dentistry, and the College of Pharmacy. To make way for this, three private medical schools, then existing in the State, surrendered their charters. In 1908, the only remaining private school, affiliated with Hamline University, was abandoned, its students entering the College of Medicine and Surgery for the completion of their courses of study. In 1910, the gradual diminution and the final lack of matriculants led to the abolition of the College of Homeopathic Medicine and Surgery. The teaching of medicine in the State University is now essentially non-sectarian. The history of the College of Medicine and Surgery is epitomized in results, the achievement of which marks the State, in this particular, as unique. Medical education in Minnesota has been standardized and unified, under the full control of the State University. The era of the private medical school in Minnesota has passed, as it is passing rapidly elsewhere.

Raising educational standards.—Step by step, the preliminary requirements of the College have been advanced from those of a meagre common school training to that of a high school diploma; thence to one, and, later, to two years of specialized academic training; and, finally, to the attainment of a baccalaureate degree. The school term has been gradually extended from six months to the full University period. The Faculty plans the early adoption of the summer quarter and the revolving scholastic year. The curriculum, which initially covered three years, has been increased to four and, recently, to five years of medical study, the fifth year covering a standard hospital internship or service in a laboratory as a condition of the degree. Despite these progressive steps toward higher educational standards, the registration of the College is steadily growing.

Faculty organization.—So fully have laboratory methods superseded the old type of teaching, that the charter faculty of sixteen members has necessarily grown into an Executive Faculty, consisting of the directors of nine departments of instruction, with a general faculty including fifty-eight professors and fifty lecturers, demonstrators, and instructors.

Buildings.—The medical buildings of the older campus have been

outgrown. One of these has been surrendered to the College of Dentistry and another to the College of Pharmacy. The Institute of Public Health and Pathology and the small Medical Chemistry Pavilion still remain in use upon the old medical quadrangle; while upon the new campus the Institute of Anatomy and the new Millard Hall, model laboratory buildings, built and equipped at a joint cost of \$636,000, are now completed and occupied.

Hospital facilities.—A new era in medical education has begun with the development of the teaching hospital, the practical laboratory of clinical medicine. With the establishment of a University Hospital (open to the needy of the State upon medical certification) under the full ownership and control of the University, Minnesota enters into the dawn of this educational day. The initiation of hospital facilities was potentialized by the gift of \$120,000 from the estate of Dr. and Mrs. A. F. Elliot. To this, citizens of Minneapolis added a donation of \$42,000 for a hospital site and the State added appropriations for completion and equipment aggregating \$88,000. These sums have given the College the present use of one hundred and twenty beds, with temporary service buildings and an emergency pavilion. Medical, surgical, and obstetrical clinics are maintained in the in-patient department and special clinics, as well, in the out-patient service. Prior to the opening of the Elliot Memorial Building, temporary hospitals were conducted for two years in residence buildings on the new campus. This informal service gave the University a valuable opportunity for the experimental study of its clinical needs; while it proved the economic need of the State and the benefits that the University Hospitals afford. In these temporary quarters 951 patients were cared for, 498 surgical operations were performed, and 328 clinics were held. Since the dedication of the Elliot Hospital, it has provided for the treatment of 913 patients, for the performance of 413 surgical operations, and for the conduct of 390 clinics. Small sections of students, under the immediate supervision of experienced clinical teachers, are daily in the wards. For hospital maintenance, including the out-patient department, the Legislature appropriated \$79,600 a year for the last biennial period.

There is urgent need of new buildings and a present demand for the increase of the hospital capacity to three hundred beds.

Out-patient service.—The out-patient department, formerly known as the University Dispensary, has had a remarkable growth. During the past year, its clinics have given 33,190 consultations and have entered 9,229 new patients. It employs a staff of forty-eight clinical teachers and of six nurses. It extends its usefulness to the homes of indigent families. Its visiting physicians have made, during the last school year, 1,084 house visits and have attended 64 births. As compared with 1911 the work has more than doubled during 1912, while it has been more than three times greater than in 1910.

The establishment of the University Hospitals has given opportunity for the organization of the first School for Nurses, as a Department of University teaching and under direct University control, to be found

anywhere in the world. Students to the number of nineteen have been admitted to the School, which maintains an efficient standard of training; training indeed of a type which can only be had in a teaching hospital.

Relocation of Pathology Building.—With the new location of the Hospitals and the laboratory buildings on the newer campus, an important member of the teaching group, the Institute of Public Health and Pathology, is seriously dislocated by its remote situation upon the old campus. It is hoped that this building may be utilized for other University purposes and that it may soon be replaced for the use of the Medical College by a larger laboratory on the new campus, in immediate relation to the Hospital with which its work is very intimately and vitally associated.

Increase of salaries.—With the increasing demand which modern medical education makes for higher training and the greater devotion of time upon the part of the medical teacher, it is imperatively necessary that larger salaries shall be paid to the members of the teaching staff. A proper command of the time and interest of the clinician engaged in teaching makes it desirable that he should have due compensation for his teaching service. The College of Medicine and Surgery looks anxiously to the consummation of these policies of expansion, as a result of which its teaching may be better correlated and every department of special, as well as general, medicine may share in the uses of the object lessons of clinical instruction which the hospital system affords.

Lines of future growth.—Modern medicine in the conception of the medical educators of Minnesota demands: (1) The highly individualized laboratory study of the sciences fundamental to medicine; (2) the adequate development of the teaching hospitals through which laboratory methods may be applied to clinical study; (3) a new emphasis upon the study of preventive medicine, through which medical and lay officers may be educated for the public health service; (4) the cultivation of opportunities for postgraduate and research work with direct reference to the training of specialized educators in medicine, to the relief of the present famine of the schools. Such a type of education, so outlined, must be conducted by highly endowed or state supported institutions, for it is necessarily maintained at great cost, it necessarily involves large tuition fees, and it necessarily requires a long period of instruction. These facts put special stress upon the need for adequate provision for scholarships and teaching fellowships, through the privileges of which men and women of large talent and limited means may find opportunity of development which they might otherwise miss. In our own and other civilized countries medical education is undergoing a complete revolution due to the demand of the people that the physician become in increasing degree a social servant. His preparation for his life work becomes therefore an obligation on society. To meet this obligation large sums of money are being invested in the natural centers of medical education throughout the world.

Summary of needs.—The summarized needs of the present are for better trained practitioners of medicine; for specialized medical teachers;

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for well-equipped conservators of the public health; for scientific investigators who may lay broader the foundations of the medicine of the future.

Statistics.—Table I gives the annual registrations and number of students receiving the degree of M.D. from the year 1888-89 to the year 1911-12 inclusive. Table II gives the statistics of scholarship for the year 1911-12.

TABLE I. REGISTRATIONS, 1888-1912

YEAR	FIRST YEAR STUDENTS	SECOND YEAR STUDENTS	THIRD YEAR STUDENTS	FOURTH YEAR STUDENTS	SPECIAL OR UNCLASSED STUDENTS	GRADUATE STUDENTS	GRADUATES	TOTAL REGISTRATION
1888-89	33	26	16	..	..	..	16	75
1889-90	37	32	18	..	..	..	15	87
1890-91	62	38	24	..	..	..	19	124
1891-92	53	49	31	..	10	..	28	143
1892-93	74	39	37	..	23	..	37	173
1893-94	80	50	39	..	30	..	38	199
*1894-95	96	60	49	..	26	..	49	231
1895-96	69	20	72	57	26	..	47	244
1896-97	74	54	16	64	13	..	56	221
1897-98	87	65	46	20	8	..	17	226
1898-99	98	85	55	39	4	..	39	281
1899-00	128	87	73	53	3	..	46	344
1900-01	93	91	73	66	..	7	69	330
1901-02	136	83	76	66	..	1	63	362
1902-03	54	109	78	73	..	1	73	315
1903-04	49	48	91	75	..	3	71	266
1904-05	53	43	50	81	..	..	74	227
1905-06	58	40	44	50	..	..	49	192
1906-07	52	57	36	41	..	4	39	190
1907-08	32	47	52	35	..	..	32	166
1908-09	49	30	40	55	3	3	51	180
1909-10	59	44	35	33	..	..	31	171
1910-11	51	54	36	25	..	5	19	171
1911-12	62	40	46	35	..	3	37**	186

†Hamline University Students

1908-09	..	35	17	21	..	..	18	73
1909-10	..	2	11	3	..	..	3	16
1910-11	..	..	..	6	..	..	6	6

* First eight years only a three-year course given.

** Two graduates of former classes received degree at this date.

† In 1908, the College of Physicians and Surgeons of the Medical Department of Hamline University was merged with that of the University of Minnesota, matriculants being admitted from the former College, completing work at the University of Minnesota, and being recommended to Hamline University for the degree of M.D.

TABLE II. STATISTICS OF SCHOLARSHIP, 1911-1912

	1ST YEAR	2D YEAR	3D YEAR	4TH YEAR	TOTAL
Number of students passed in all subjects.....	27	22	33	35	117
Number of students passed in all subjects taken.....	2	4	..	..	6
Number of students conditioned in one or more subjects.....	18	6	11	..	35
Number of students failing and repeating work.....	5	4	..	..	9
Number of students dismissed for poor scholarship.....	1	2	..	..	3
Number of students discontinuing course.....	3	..	..	..	3
Number of students with incompletes.....	6	2	2	..	10
					183
Number of students receiving B.S. degree.....	..	14	12	3	..
Number of students receiving M.D. degree.....	..	..	..	37	..
Number appointed to hospital internships.....	..	..	..	31	..

Geographical distribution of students.—Students from Minnesota were registered by counties as follows: Becker, 1; Brown, 2; Chisago, 1; Crow Wing, 1; Faribault, 1; Fillmore, 5; Freeborn, 1; Goodhue, 4; Grant, 1; Hennepin, 57; Hubbard, 2; Isanti, 2; Jackson, 2; Lac qui Parle, 2; Le Sueur, 4; Lyon, 1; McLeod, 3; Mahnomon, 1; Martin, 1; Nobles, 1; Olmsted, 1; Ottertail, 4; Pope, 1; Ramsey, 31; Redwood, 1; Renville, 1; Rice, 5; Saint Louis, 6; Scott, 2; Stearns, 1; Todd, 1; Wadena, 1; Waseca, 2; Washington, 2; Watonwan, 1; Yellow Medicine, 1. Students were also registered from other states as follows: California, 1; Illinois, 3; Iowa, 5; Nebraska, 1; North Dakota, 7; Ohio, 1; South Dakota, 4; Washington, 4; Wisconsin, 3. Total, 183.

I wish to incorporate the following extracts from the report of the Superintendent of Hospitals: (1) Introductory statement by Dr. L. B. Baldwin, Superintendent of Hospitals. (2) Statistical report. (3) Operating expenses for year ending July 31, 1912. (4) Classification of cost per patient per day. (5) Comptroller's statement: (a) Hospital building fund, (b) Hospital equipment fund, (c) Hospital site fund, and (d) Hospital support fund. (6) Table showing distribution of patients by counties.

To the Dean of the College of Medicine and Surgery:

SIR: I have the honor to submit the following report of the University Hospitals.

As this is the first report to be issued, it has been deemed proper, in order to have a satisfactory basis for future reports, to cover so far as possible the period of the operation of the Hospitals from the time of the opening of the temporary hospital on March 22, 1909 to July 31, 1912.

Temporary quarters.—These were granted by the Board of Regents early in 1909, and consisted of the dwelling houses at 200 and 304 State St. S. E. and 303 Washington Ave.

These buildings were equipped to care for 24 patients and the necessary force of nurses and employees. Later the building at 119 State St. S. E. was secured for hospital purposes and equipped for 18 patients. The temporary hospital was opened for the admission of patients, March 22, 1909 and its operation continued until September 15, 1911. In the early summer of 1910 the Board of Regents assigned the buildings at 324 Union St. and 417-419 Delaware St. to the Hospital, the former to be used for the housing of internal medical cases and the latter as a Nurses' Home. I assumed the duties of Superintendent August 3, 1910, and proceeded to the preparation and equipment of the two last mentioned buildings for the purposes indicated. These were duly occupied and thereupon the building at 304 State St. was assigned as a residence for the Superintendent and occupied, and the building at 119 State St. vacated and its use as a hospital building discontinued. The operation of the temporary hospital continued under this arrangement, the building at 303 Washington Ave. being used for the housing of surgical and obstetrical cases, until the occupation of the Elliot Memorial Building, September 15, 1911, at which time the building was opened with appropriate exercises held in the University Chapel and at the building. Subsequently the building at 324 Union St. was equipped as a Nurses' Home to provide quarters for the larger number of nurses required in the operation of the Elliot Memorial Building, and the building at 413 Delaware St. was assigned by the Board of Regents for use as quarters for female employees in the domestic department of the hospital. Upon its occupation for that purpose the building at 200 State St. was released and its use for hospital purposes discontinued.

Present hospital buildings.—At present the buildings in use for hospital purposes are as follows: Elliot Memorial Building, Essex and Union Sts., capacity 120; brick flat building, 417-419 Delaware St., Nurses' Home; frame building, 324 Union St., Nurses' Home; frame building, 413 Delaware St., Domestic's Home; frame building, 304 State St., Superintendent's Residence; frame building, 303 Washington Ave., held in reserve for cases of contagious disease developing in the Elliot Memorial Building.

The Elliot Memorial Building.—This hospital was erected with funds derived from the following sources:

(1) Bequest from the estate of Dr. and Mrs. A. F. Elliot.....	\$100,000.00
(2) Contribution from Mr. Walter J. Trask.....	13,000.00
(3) Accrued interest on the above (approximate amount).....	7,000.00
(4) Legislative appropriation.....	40,000.00
Total.....	\$160,000.00

Construction work on the Elliot Memorial Building was begun in the Spring of 1910 and completed in August, 1911. The building consists of four stories and basement and is fire-proof. It has a capacity of 120 beds, divided among the three different services as follows: Medicine, 60 beds; Surgery, 40 beds; Obstetrics, 20 beds. At the present time internal medical, surgical, and obstetrical cases only are admitted. This arrangement was made necessary by reason of the fact that the admission of cases under all the special branches of medicine would result in the establishment of several clinics of such small size as to impair their teaching value. As now arranged more satisfactory clinics in the three great branches of medicine are afforded than would otherwise be possible.

Number of patients, costs, etc.—During the period covered by this report (March 22, 1909 to July 31, 1912) there were admitted a total of 1,864 cases as detailed in the tables presented herewith. Of this number 1,665 were discharged; 123 died; and 76 remained in the Hospital July 31, 1912. The daily average number of patients has been taken for the year beginning August 1, 1911 and ending July 31, 1912, only, and was 82.25. This low daily average was caused by the small number of patients admitted during the first two or three months following the opening of the Elliot Memorial Building. There were 718 clinics held and 75 necropsies performed.

The average cost per patient per diem for the same period was \$2.16. In the determination of this per capita cost for the year, the expenses of conducting the Out-Patient Department, transfers to the current support fund of the University to cover expenditures therefrom on account of the Hospital in the year 1910-1911, and an expenditure of \$1,500.00 paid to the St. Paul Free Dispensary, have not been included. In comparing this per capita cost with that of other purely charitable hospitals, it should be remembered that \$9,500.00 was paid in clinical salaries to members of the Hospital staff in accordance with the budget for 1911-1912.

Out-patient service.—The University Free Dispensary was reorganized in 1909 and thereby made the Out-Patient Department of the Hospital. Statistics for the current year ending July 31, 1912 show a large increase in attendance of patients over the preceding year. The number of new patients treated was 9,229. The total number of visits was 33,190, giving a daily average attendance of 109. The cost per patient's visit was \$0.17. The number of prescriptions issued was 13,513, for which \$1,210.20 was collected and turned over to the University Comptroller.

Unsatisfactory buildings.—Your attention is called to the dangerous and unsatisfactory character of the buildings, now used as quarters for Nurses. The building at 417-419 Delaware St. is a brick-veneered, two-story frame structure divided into four flats. The basement is used as a hospital laundry and by reason of the presence of a boiler necessary to furnish steam for laundry purposes and to heat the building, the fire risk on the building is a large one. The presence of the laundry machinery and its operation six days per week renders the building undesirable for housing nurses on account of the noise and odors from the laundry. The building at 324 Union St. is also undesirable for the reason that it is an old frame dwelling unsuited by its arrangement for the use to which it is now put. Both of these buildings are a menace to their occupants and a nuisance to the two recently occupied new medical buildings. A Nurses' Home should be provided at the earliest possible time, and provision made for a hospital laundry.

Statistical tables.—Here follow tables in which details concerning the administration and finances of the hospital service are set forth.

Respectfully submitted,

L. B. BALDWIN, *Superintendent*

TABLE III. NUMBERS OF PATIENTS, AVERAGES, PER DIEM COSTS, ETC.

NUMBER OF PATIENTS:	
Patients at beginning of period, March 22, 1909.....	0
Patients admitted during period, March 22, 1909 to July 31, 1912 inc.....	1,864
Patients treated during period, March 22, 1909 to July 31, 1912 inc.....	1,864
Total days of hospital care, March 22, 1909 to July 31, 1912 inc.....	54,765
Average days per patient, for period, March 22, 1909 to July 31, 1912 inc.....	29.3
Highest daily census, for period, March 22, 1909 to July 31, 1912 inc.....	125
Daily average number of patients in Hospital, for period, Aug. 1, 1911 to July 31, 1912 inc.....	80.25
AVERAGE COSTS (Aug. 1, 1911 to July 31, 1912 inc.)	
Daily average cost per patient.....	\$2.16
Daily cost per capita for provisions for all persons supported.....	.3228
OUT-PATIENT DEPARTMENT (Aug. 1, 1911 to July 31, 1912 inc.)	
New patients treated.....	9,229
Total patients visits made.....	33,190
Average visits per day.....	109
Daily average cost per patient.....	.174
Total prescriptions issued.....	13,513

TABLE IV. OPERATING EXPENSES, 1911-1912

ADMINISTRATION EXPENSES—	
Salaries: officers and clerks.....	\$4,354.03
Office expenses.....	76.25
Stationery, printing, and postage.....	449.37
Telephone and telegraph.....	582.00
Miscellaneous and reserve.....	6,272.02
	<hr/>
	\$11,733.67
PROFESSIONAL CARE OF PATIENTS—	
Salaries and wages.....	\$7,754.61
Equipment for nurses.....	149.95
Medical and surgical supplies:	
Apparatus and instruments.....	\$ 450.61
Medical supplies.....	1,500.00
Surgical supplies.....	1,974.20
Alcohol, liquors, wines.....	131.58
	<hr/>
	4,056.39
Dispensary.....	8,132.97
Emergency ward.....	
Visiting and home nursing.....	
	<hr/>
	\$20,093.92

TABLE IV—Continued

DEPARTMENT EXPENSES—			
Ambulance.....		\$	10.50
Pathological Laboratory.....			1,592.17
Training School.....			1,432.94
Housekeeping.....			4,958.92
Kitchen.....			1,307.17
Laundry.....			2,869.25
Steward's Department:			
Labor.....	\$1,200.00		
Bread.....	1,024.44		
Milk and Cream.....	2,662.20		
Groceries.....	3,965.24		
Butter and Eggs.....	3,700.00		
Fruit and Vegetables.....	2,405.51		
Meat, Poultry, and Fish.....	4,184.76	19,142.15	
			\$31,313.10
GENERAL HOUSE AND PROPERTY EXPENSES—			
Gas, Ice, and Water.....		\$2,229.07	
Maintenance, Real Estate and Buildings.....		252.19	
Maintenance, Machinery and Tools.....		35.78	
Plumbing and Steamfitting.....		2.00	
X-Ray and Photography.....		995.01	
			\$3,514.05
SUPERINTENDENT'S LIVING EXPENSES.....			1,460.53
CLINICAL SALARIES.....			9,500.00
			\$77,615.27

TABLE V. CLASSIFICATION OF COST PER PATIENT PER DAY

DEPARTMENTS	DISBURSE- MENTS	PER CAPITA	DISBURSE- MENTS	PER CAPITA
Administration.....	\$ 6,922.18	.230	.....	.....
Superintendent of Nurses, Assistants, and Instructors.....	2,267.34	.075	.....	.....
Nurses.....	6,317.11	.213	.....	.....
Orderlies.....	1,124.84	.036	.....	.....
Ward Employees.....	906.79	.030	.....	.....
Equipment for Nurses and Training School Supplies.....	418.71	.012	.....	.....
Medical and Surgical Supplies.....	4,056.39	.134	.....	.....
Out-Patient Department.....	.....	.....	\$6,922.77	.174
X-Ray Service.....	995.01	.032	.....	.....
Ambulance.....	10.50	.001	.....	.....
Pathological Laboratory.....	1,592.17	.052	.....	.....
Housekeeping.....	4,710.33	.155	.....	.....
Kitchen.....	1,307.17	.046	.....	.....
Laundry.....	2,912.93	.095	.....	.....
Steward's Department.....	19,295.15	.641	.....	.....
General House and Property Expenses.....	2,557.34	.084	.....	.....
Clinical Salaries.....	9,500.00	.324	.....	.....
	†\$64,893.96	\$2.160	*\$6,922.77	.174

*Out-Patient Department Disbursements..... \$8,132.97

Out-Patient Department Receipts..... 1,210.20

Out-Patient Department Actual Cost..... \$6,922.77

†Does not include: Out-Patient Department..... \$8,132.97
 St. Paul Free Dispensary..... 1,500.00
 Transferred to Current Expense..... 3,088.34

\$12,721.31

TABLE VI. BALANCES OF HOSPITAL FUNDS AS OF JULY 31, 1912

BUILDING FUND		
Balance on hand Aug. 1, 1911.....	\$31,907.59	
Account J. D. Bren Matter Feb. 1912.....	113.37	
Transfer from Equipment Fund May, 1912.....	1,462.50	
Receipts, April, May, 1912.....	50.00	
Receipts, June, July 31.....	78.00	
Total.....	\$33,611.46	

TABLE VI--Continued

Expenses for the year 1911-1912		
August.....	\$17,807.00	
September.....	7,820.00	
October.....	528.93	
November.....	46.64	
December.....	35.00	
January.....	3,990.00	
April.....	60.00	
May.....	2,808.31	
Total.....		\$33,095.88
Balance on hand July 31, 1912.....		\$515.58
EQUIPMENT FUND		
Balance on hand Aug. 1, 1911.....	\$42,354.15	\$42,354.15
Expenses for the year 1911-1912		
September.....	\$ 900.00	
October.....	5,230.33	
November.....	3,040.81	
December.....	923.57	
January.....	7,264.65	
February.....	3,957.59	
March.....	1,886.42	
April.....	613.23	
May.....	2,689.73	
June.....	1,299.42	
July.....	180.22	
Total.....		\$27,985.97
Balance on hand July 31, 1912.....		\$14,368.18

TABLE VII. CONDITION OF THE SITE FUND

Balance forwarded to State Treasurer.....	\$5,630.31	\$5,630.31
Expenses for the year 1911-1912		
Sept. 28 W. V. Blomquist for writing specifications.....	1.00	
Oct. 9 Dispatch Printing Co., Adv.....	3.25	
K. S. Harrison for designing tablets.....	27.79	
Improvement Bulletin, Adv.....	3.30	
Minneapolis Journal, Adv.....	2.08	
Dec. 13 Flour City Orn. Iron Works, bronze tablets.....	218.00	
Feb. 10 Journal Printing Co., Adv.....	2.25	
July 12 Dispatch Printing Co., Adv.....	3.00	
Improvement Bulletin, Adv.....	1.50	
Minneapolis Journal, Adv.....	.96	
Minneapolis Tribune, Adv.....	.96	
June 22 Hoy & Elzy, Retaining Wall.....	1,427.00	
July 14 Extension of Wall, extra.....	136.00	
Oct. 10 J. & E. Nord, Retaining Wall.....	1,830.00	
Nov. 1 H. C. Carlson, grading.....	5.00	
June 6 Libby & Nelson, hauling.....	2.72	
Total.....		3,664.81
Balance on hand July 31, 1912.....		\$1,965.50

TABLE VIII. CONDITION OF THE SUPPORT FUND

Balance on hand Aug. 1, 1911.....	\$11,948.17
New appropriation Aug. 1, 1911.....	79,600.00
August and September receipts.....	178.15
October receipts.....	76.83
Refund salary, December.....	20.00
November and December receipts.....	202.62
Refund salary, January.....	35.00
January receipts.....	115.10
February receipts.....	111.56
March receipts.....	119.00
Refund salaries, May.....	38.06
April receipts.....	129.80
May receipts.....	126.47
June receipts.....	117.80
July receipts.....	215.27
Total.....	\$93,033.83

Expenses for the year 1911-1912

August.....	\$3,607.35
September.....	3,210.28
October.....	7,655.10
November.....	4,868.84
December.....	4,767.49
January.....	6,583.77
February.....	8,949.13
March.....	9,346.02
April.....	7,444.15
May.....	8,911.04
June.....	5,784.39
July.....	5,168.61
Total.....	\$76,296.17
Balance on hand July 31, 1912.....	\$16,737.66

Certified by G. H. HAYES,
Comptroller of the University

TABLE IX. DISTRIBUTION OF PATIENTS BY COUNTIES
(March 22, 1909-July 31, 1912)

COUNTY	MALE	FEMALE	TOTAL	COUNTY	MALE	FEMALE	TOTAL
Aitkin.....	2	6	8	Meeker.....	3	2	5
Anoka.....	6	3	9	Millelacs.....	1	1	2
Becker.....	9	5	14	Morrison.....	6	5	11
Beltrami.....	7	1	8	Mower.....	5	5	10
Benton.....	1	2	3	Murray.....	1	1	2
Bigstone.....	0	1	1	Nicollet.....	13	9	22
Blue Earth.....	0	0	0	Nobles.....	0	0	0
Brown.....	4	3	7	Norman.....	1	2	3
Carlton.....	0	1	1	Olmsted.....	1	0	1
Carver.....	2	0	2	Ottertail.....	2	1	3
Cass.....	6	2	8	Pennington.....	0	1	1
Chippewa.....	6	4	10	Pine.....	10	7	17
Chisago.....	5	5	10	Pipestone.....	1	1	2
Clay.....	0	0	0	Polk.....	4	3	7
Clearwater.....	2	2	4	Pope.....	0	1	1
Cook.....	0	0	0	Ramsey.....	41	42	83
Cottonwood.....	0	0	0	Red Lake.....	1	2	3
Crow Wing.....	2	1	3	Redwood.....	4	2	6
Dakota.....	8	5	13	Renville.....	7	3	10
Dodge.....	2	5	7	Rice.....	4	5	9
Douglas.....	4	1	5	Rock.....	0	0	0
Faribault.....	3	3	6	Roseau.....	3	1	4
Fillmore.....	0	1	1	Saint Louis.....	11	9	20
Freeborn.....	4	0	4	Scott.....	5	1	6
Goodhue.....	4	3	7	Sherburne.....	7	6	13
Grant.....	0	1	1	Sibley.....	7	0	7
Hennepin.....	594	633	1,227	Stearns.....	11	10	21
Houston.....	1	1	2	Steele.....	0	3	3
Hubbard.....	2	8	10	Stevens.....	1	0	1
Isanti.....	9	10	19	Swift.....	2	4	6
Itasca.....	0	8	8	Todd.....	3	5	8
Jackson.....	0	1	1	Traverse.....	1	2	3
Kanabec.....	1	2	3	Wabasha.....	4	4	8
Kandiyohi.....	1	2	3	Wadena.....	3	0	3
Kittson.....	2	0	2	Waseca.....	2	3	5
Koochiching.....	1	2	3	Washington.....	4	5	9
Lac qui Parle.....	7	1	8	Watsonwan.....	0	0	0
Lake.....	1	0	1	Wilkin.....	1	0	1
Le Sueur.....	6	4	10	Winona.....	1	1	2
Lincoln.....	4	4	8	Wright.....	16	20	36
Lyon.....	13	6	19	Yellow Medicine.....	7	9	16
McLeod.....	6	7	13	County Unknown.....	5	3	8
Mahnomen.....	5	4	9				
Marshall.....	3	1	4	Total.....	933	931	1,864
Martin.....	1	3	4				

With the above report of the Superintendent of University Hospitals this report of the College of Medicine and Surgery is concluded.

Respectfully submitted,

F. F. WESBROOK, *Dean*

THE COLLEGE OF DENTISTRY

To the President of the University:

SIR: I herewith submit my report as Dean for the year 1911-12.

Historical.—In 1887-88 the private medical and dental schools of the State of Minnesota tendered their charters to the Regents of the University. Acceptance followed immediately, and the first course was offered in the University College of Dentistry, beginning with the year 1888-89. The significant phase of the whole movement was the readiness with which the affiliation was effected. In a measure this was due to the hearty co-operation of the profession who saw by this means an effective check upon mercenary exploitation. It is significant to note that this early manifestation of interest in the most powerful instrument for good has been a factor in the evolution of the College; the profession could be depended upon for its support. Another item of no less importance was the unconscious atmosphere created by the first faculty in common with the staunch pioneers who practised dentistry in Minnesota at that time. The aims and ideals of the early years have left a certain tradition which has been of the greatest value in the development of the College; otherwise the equipment was characteristic of a struggling University. Buildings were used in common by the entire Medical Department for the first twelve years. Many of the courses were identical. The increase in volume of knowledge to be acquired by students in each case necessitated the establishment of separate courses for the dental students in the fundamental studies in Medicine. The teaching of Chemistry was taken over by the School of Chemistry in 1905. It has been the effort of the Faculty to overcome a certain segregational feeling which has existed for some time in universities in regard to technical schools. In other words, to create a true university atmosphere has been an aim of the Faculty. With this end in view new teachers with more or less academic training have been chosen, and graduate study has been directed along such lines as would further enhance this exceptional value. The narrowing tendency of technical pursuits also makes this liberalizing policy an essential.

The curriculum.—Owing to the fact that the educational program in nearly all dental colleges is more or less vague, a strong effort has been made to systematize the teaching of dental subjects in accordance with academic methods. The result is already gratifying and still promises much in the sense that more and better work is being done yearly. The standard is continually being raised. A spirit of higher idealism seems to pervade the entire institution, which has made it easier to maintain a high grade of scholarship with a sort of unconscious and yet systematic

elimination of the unfit, so that only about 65 to 75 per cent of those who enter in the freshman year are graduated the end of the third.

Registration.—The attendance shows a gradual increase (Table I). In this connection it should be stated that for the last five years about 25 students who had not spent their freshman year in Minnesota, have been refused admittance to the junior and senior classes. It has finally been deemed wise, owing to a lack of facilities, to limit the freshman class to 90 students.

TABLE I. REGISTRATIONS, 1888-1912

1888-89.....	22	1901-02.....	107
1889-90.....	28	1902-03.....	142
1890-91.....	36	1903-04.....	137
1891-92.....	50	1904-05.....	121
1892-93.....	61	1905-06.....	150
1893-94.....	43	1906-07.....	162
1894-95.....	79	1907-08.....	176
1895-96.....	90	1908-09.....	193
1896-97.....	97	1909-10.....	196
1897-98.....	96	1910-11.....	206
1898-99.....	110	1911-12.....	247
1899-00.....	125		
1900-01.....	106	Total.....	2780

Geographical distribution.—The College has drawn students from the northwestern territory in general, the state of Minnesota and the Dakotas more heavily, and also a fair sprinkling from other states in the Union; an occasional student from Europe has also been in attendance. During the year 1911-12 students have been registered by Minnesota counties as follows: Anoka, 1; Becker, 1; Beltrami, 1; Blue Earth, 4; Brown, 3; Chisago, 2; Clay, 1; Carver, 1; Crow Wing, 1; Chippewa, 4; Dodge, 3; Douglas, 4; Freeborn, 3; Fillmore, 7; Faribault, 1; Grant, 1; Goodhue, 8; Hennepin, 63; Houston, 3; Jackson, 2; Kandiyohi, 3; Kittson, 1; Lake, 1; Le Sueur, 6; Lac qui Parle, 1; Lyon, 1; Marshall, 2; Martin, 1; Millelacs, 1; McLeod, 1; Morrison, 2; Meeker, 3; Mower, 4; Nobles, 1; Nicollet, 4; Norman, 1; Olmsted, 3; Ottertail, 6; Pope, 3; Ramsey, 12; Renville, 5; Saint Louis, 4; Sibley, 1; Stevens, 1; Stearns, 7; Scott, 3; Traverse, 3; Todd, 1; Watonwan, 2; Waseca, 5; Winona, 6; Wright, 7; Yellow Medicine, 2. From outside the State students have registered thus: Iowa, 1; Indiana, 1; Montana, 2; Nebraska, 1; North Dakota, 6; Ohio, 1; South Dakota, 6; Washington, 2; Wisconsin, 5; Japan, 1; Norway, 3. Summary: Minnesota, 218; other states, 25; foreign countries, 4.

Educational standards.—The profession of dentistry has peculiar obligations. In no other calling is the individual conscience so much the sole judge, and, perhaps, in no other calling, excepting other branches of the healing art, can so much harm be done to humanity, hence it becomes a moral necessity to study carefully the moral, intellectual, and technical fitness of each student. Owing to this conscious and unconscious practise of studying the fit, many students withdraw who would actually have been dismissed at the end of the quarter or semester. The

curriculum in the College of Dentistry is continually evolving from the traditional chaos. Changes, however, are gradually effected. The intention is to make men more efficient in the technical sense, as well as the moral sense, in the service of the community. To this end the departmental organizations are intensified and strengthened.

Professional progress.—Much valuable and reasonable work can be done in the future by systematically studying pathological conditions. In fact this is the greatest field in dentistry to-day. It is the kind of research work upon which preventive dentistry is based. It enlarges the scope of dental practise from a narrow curative tendency to one of greater social effort and responsibility. It is, therefore, the branch in Dentistry especially to be encouraged by providing more thorough equipment and the trained men to carry on the work continually.

Needs of the College.—The College has been greatly handicapped in the past by not maintaining the clinic throughout the year. It is difficult to start this in the fall after a cessation of three or four months. It is injurious to cease treating irregularities of the teeth, and to allow patients to shift during the summer months without regular attendance. Moreover, much clinical material is lost because there is no summer clinic. Again this policy closes the one opportunity for service to many suffering persons who take advantage of the free treatment offered. A summer clinic would afford an opportunity for many students to intensify their experience in practical work. It is really necessary for some students who, for legitimate reasons, are prevented from keeping up with their fellows, to have this chance. The College should be able to provide operating chairs at all times to eligible students. This is not possible at present owing to a lack of floor space. Additional recitation rooms are also needed. The College should be able to offer two scholarships each in the departments of Oral Surgery, Pathology, Orthodontia, Crown and Bridge Work, and Operative Dentistry. They should continue from one to two years and carry a stipend of from \$300 to \$600 each. Each scholar should render service from three to six half days each according to the necessities of the department. With these additions and improvements dentistry can be made a much stronger factor in improving the health and happiness of the people.

Respectfully submitted,

ALFRED OWRE, *Dean*

THE COLLEGE OF PHARMACY

To the President of the University:

SIR: I beg leave to submit herewith my annual report for 1911-12.

Historical.—In the early eighties the progressive pharmacists of Minnesota organized a state society to bring about certain reforms in, and to elevate the standard of, pharmacy. The two definite purposes for which the association was formed were to bring about (a) the enactment of a law to regulate the practice of pharmacy, and (b) the establishment of a college of pharmacy of a high type. The law was enacted in 1884 and soon after the University Regents were requested to add a college of pharmacy to the departments of the University. The Regents had no money for such a college at their disposal at the time. Ex-Governor Pillsbury, always the friend of the University and anxious to increase its service to the people of the State, greatly favored the addition of a college of pharmacy to the University and at one time was ready to provide the necessary money. In 1891, however, with the co-operation of the pharmacists, the Regents succeeded in obtaining a legislative appropriation of \$5,000. The organization of the College of Pharmacy as a part of the University was then authorized by the Regents and the first courses were offered in the fall of 1892. The organization and direction of the College were entrusted to me. The College at first became a part of the Medical Department which then consisted of the College of Medicine and Surgery, the College of Homeopathic Medicine and Surgery, the College of Dentistry, and the College of Pharmacy. A little later with the segregation of these divisions, the College of Pharmacy became an independent unit. The courses have been improved continually since that time so far as the exchequer of the University permitted. The first years of the College were ones of unceasing struggle for adequate quarters and equipment. The College was first housed in the small medical chemical laboratory, in which it occupied one good-sized room which served as office, lecture room, and laboratory. A year or two later the room in the northwestern corner of the first floor of Millard Hall was added to the quarters of the College. When the Medical Science Laboratory was erected, the understanding was that the College should have the entire south wing of the building. The College, however, had to compromise on one-half of that wing in which it has been quartered since, the only addition made having been

a room on the top floor in the middle pavilion of the building. The scholarship of the College has improved continually from its inception to the present. The pharmacists of the State, having been so instrumental in the establishment of the College, felt that they should have a voice in deciding the extent and nature of the courses and of the entrance requirements and, because many of them advocated very low entrance standards and because the College was anxious to create and maintain a University standard, much tact had to be exercised in the conduct of this phase of the development of the College. The College could not insist upon carrying out its own conviction that entrants should have a full high school training or an equivalent, because many pharmacists wanted to send their apprentices irrespective of their preliminary schooling. While the College made the concession of not requiring an out and out high school standard, it yet exercised an increasingly successful influence toward a high school prerequisite and was able in many instances to convince influential pharmacists of the wisdom of a better academic training of their apprentices with a result that for some years now practically all of the pharmacy matriculants have a training equivalent to that required for entrance to the College of Science, Literature, and the Arts. The courses of instruction given by the College have always been regarded as being of a high standard. However, the College has always had the hurtful reputation of not possessing sufficient laboratories. This reputation is soon to be remedied.

Registration.—The total registration during the year reached 78 (43 juniors, 27 seniors, 7 unclassified and 1 graduate student). The enrollment for 1910-11 was 90. The College of Pharmacy, like most other colleges of the University, is gradually increasing its entrance requirements. This is one reason for the lower registration the past year. Another reason lies in the fact that only the names of those actually in attendance during the year or sometime during the year have been placed on the roll. In former years the names of those students who take some practical drug-store work before graduating have been retained on the roll while gaining such experience, if they had elected to remain as members of the student-body during that time. Actually, therefore, there has been only little diminution in the number of students. The large graduating class of last year, namely 23, included a larger number than usual of the three-year course men. Of last year's students who were promoted into the senior year more than one-half followed the advice of the Faculty to take two years for the completion of the senior work. This accounts for the fact that out of the forty students promoted last spring into the senior ranks only twelve graduated in June. No doubt the graduating class of next year will be much larger. Table I shows the number of students in attendance annually and the number of graduates since the organization of the College in 1892. This table is taken from our own college records and is correct. The Registrar's statistics do not correspond with ours because of differences in registration. These differences have now been eliminated and the records in both offices should agree in the future.

TABLE I. ATTENDANCE AND GRADUATION, 1892-1912

YEAR	TOTAL ATTEND- ANCE	NUMBER OF GRADUATES	YEAR	TOTAL ATTEND- ANCE	NUMBER OF GRADUATES
1892-93.....	11	..	1902-03.....	55	8
1893-94.....	25	6	1903-04.....	68	14
1894-95.....	37	1	1904-05.....	67	16
1895-96.....	34	25	1905-06.....	80	17
1896-97.....	35	18	1906-07.....	76	17
1897-98.....	60	12	1907-08.....	99	18
1898-99.....	68	21	1908-09.....	102	24
1899-00.....	62	16	1909-10.....	82	19
1900-01.....	63	15	1910-11.....	90	23
1901-02.....	62	19	1911-12.....	77	12

Geographical distribution of students.—The following countries and states were represented: Canada, 1; Illinois, 1; Iowa, 3; South Dakota, 2; Wisconsin, 5. The 65 students from Minnesota represented the following counties: Brown, 4; Chippewa, 1; Cottonwood, 1; Douglas, 1; Faribault, 1; Freeborn, 1; Hennepin, 21; Hubbard, 2; Kandiyohi, 1; Marshall, 1; Meeker, 2; Millelacs, 1; Morrison, 1; Mower, 1; Ottertail, 1; Pennington, 1; Pine, 1; Ramsey, 7; Red Lake, 1; Redwood, 2; Rice, 1; Saint Louis, 1; Sibley, 2; Stearns, 1; Todd, 1; Watonwan, 1; Winona, 1; Wright, 5; Yellow Medicine, 1.

Scholarship statistics.—During the past year 133 students, including 56 medical students, were instructed by the Pharmacy Faculty. This student body submitted to 579 final tests with a result as follows: Excellent, 51; Good, 163; Pass, 303; Incomplete, including discontinuances of work, 5; Conditions, 41; Failures, 16. The reason that there is so comparatively large a number of passes is explained by the fact that we require a minimum of 75 per cent in most subjects and a minimum of 80 per cent in some for a passing mark.

An undermanned faculty.—The Faculty of the College of Pharmacy has always been more or less undermanned. The past year was conspicuous in this respect. Dr. Woerner, who had been added to the Faculty in 1910, was expected to begin his work last fall, but on account of illness was never able to take up the work that had been planned for him. However, the curriculum was carried out conscientiously, although doing so required practically all of the waking time of myself and a much larger number of hours of Drs. Newcomb and Bachman than constitute regular work.

The curriculum.—The courses were substantially the same as those of last year, except that because of the absence of Dr. Woerner, who had been added to the Faculty last spring, several of the laboratory courses had to be modified in some minor respects. The Faculty did more than its usual share of work, but did it cheerfully and freely. The appointment of Mr. John A. Handy to the Faculty as Instructor in Pharmaceutical Chemistry it is hoped will restore for the coming year the normal

amount of work to each instructor. The course in Pharmacopoeial Assay had to be somewhat abridged this year, but the course in Quantitative Analysis was lengthened by half a quarter and was substantially strengthened in a number of respects. Because of the change in Organic Chemistry from one semester's concentrated work in the junior year to two semesters in the senior year to accomplish the same work, only four students, all of them in the three-year course, could take this work the past year. The Department of Physiology could not give the usual eighteen lectures on Physiology during the first semester where they rightly belong, so exchange of work had to be arranged to enable the lectures to be given in the first quarter of the second semester. The work in Physiology is not yet on a satisfactory basis. The course in Theoretical and Practical Dispensing was strengthened this year by assigning its sub-division, Incompatibility, to Mr. W. A. Frost, who was added temporarily to the Faculty for the purpose of teaching that minor subject. The course was further strengthened by the increased work done by the University Dispensary, the drug room of which is in charge of the College of Pharmacy.

The Dispensary.—The activity and service of the University Free Dispensary have grown steadily since the College of Pharmacy took charge of the dispensing, the past year having been the most active one. A total of 13,653 prescriptions were dispensed during the year. Much of the practical work in dispensing is done by those students of the College of Pharmacy who are registered in Dispensing. The students doing this kind of work are usually seniors. This experience is very valuable for the students and enables them to do responsible work in the dispensing of actual practise.

Special lectures.—Not as many special lectures were delivered to the students this year as is usually the case, principally on account of the lack of time. Among those who delivered special lectures were the following: Mr. Winthrop G. Noyes on the subject, "The Sources of Some Drugs and the Channels through which Others Reach the Consumer"; Dr. J. S. Brewer on "The Manufacture of Toilet Preparations and Perfumes"; Mr. F. A. Upsher Smith on "Books for Pharmacists and the British Codex"; Mr. W. A. Frost in a series of ten lectures on Incompatibility; Dr. C. Naumann McCloud on "First Aids to the Injured," a series of eight lectures; Mr. E. A. Tupper, secretary of the State Board of Pharmacy, on "The State Pharmacy Laws." Dean Remington, of the Philadelphia College of Pharmacy, addressed some of the seniors during his visit to Minneapolis.

Added equipment.—Permanent equipment, including apparatus and books, to the amount of about \$1,800 has been added to the College property. Some of the more important additions include: a Lewis paraffin bath, a hot-air sterilizer, a steam sterilizer, eye-piece micrometers, turntables, 20 dissecting microscopes, a large polarizing apparatus, mechanical stages, a large sliding microtome, 3 new microscopes, 22 Brendel's pharmacognosy models, 2 large drying ovens, Ruedorff's sand baths, 3 Sartorius analytical balances, several other analytical balances,

2 steel filing cabinets, about \$500 worth of books (mostly valuable old works on pharmacy and related subjects), a number of pharmacognosy wall charts, a fanning mill, several high class drug mills, a drawing table, etc.

Departmental library.—The pharmacal departmental library was never adequate, but two years ago the Regents agreed to an expenditure of \$2,500 in two annual installments of \$1,250 each for the purchase of additional books and journals. Out of the \$1,250 available during the year just closing only about \$500 was expended for books, about \$750 having been needed to pay for the usual annual supply of scientific apparatus imported from Germany. This was not a diversion of funds since the \$1,250 was part of a legislative appropriation for books and scientific instruments, but the fact remains that the total of \$1,250 intended to be expended for books was not so used. No doubt a way will be found duly to restore the \$750 to library purposes. For this ensuing year it is hoped the full \$1,250 available can be expended for books and journals. Some other university colleges of pharmacy on a par with this College, have departmental libraries greatly superior to ours. Seminar and book research work should be a prominent part of a good pharmacy curriculum, but with our limited number of books we have been able to do only indifferent and unsatisfactory work in this respect. In the proposed Pharmacy Building some space, though limited, has been set aside for library purposes, but I can foresee that the assigned room will soon be too small to meet the demands upon it. In a curriculum that includes so much laboratory work as ours does, a library should be regarded as closely kin to a laboratory and should be equipped relatively as well as any laboratory.

Medicinal plant garden.—The garden is a pronounced success and is meeting all expectations placed upon it as an additional equipment to facilitate pharmaceutical instruction. Detailed reference was made to the garden in my last year's report. It is only necessary to state here that the Regents have authorized the addition of a strip of land on the north side of the garden, formerly in charge of the Department of Botany, but released by that department to the College of Pharmacy, that this added area has increased the usefulness of the garden, that a satisfactory crop of drugs was harvested last year, and that this season's crop is assured. The College had an exhibit of medicinal plants at the meeting of the Minnesota State Pharmaceutical Association held at Winona, June 18, 19, and 20. The exhibit aroused unusual interest and no doubt was the first one of its kind ever held in Minnesota.

Pharmacognosy plant laboratory.—The erection of a plant laboratory on the site of the old Anatomy ruins adjoining old Millard Hall was authorized some time ago. The walls of the ruins have been reduced to a level to receive a superstructure of steel and glass. Bids have already been received for this superstructure and everything is ready for placing the order. The basement of the plant house will be connected with old Millard Hall by a subway to facilitate the work in pharmacognosy.

Pharmacy Building.—The plans and specifications for the remodeling

of old Millard Hall are now in the hands of the bidders and bids are to be opened September 19th, so that actual work will not begin until sometime in October. The total of \$105,000 (\$75,000 legislative appropriation and \$30,000 insurance proceeds) will no doubt be sufficient to provide for the reconstruction of old Millard Hall and for the erection of the plant laboratory and for equipping them. It may be that the equipment may have to be curtailed somewhat.

Future development.—The physical development of the College in the immediate future, of course, has to be adapted to, and will be limited by, the new quarters which the College is soon to occupy. Old Millard Hall can at best be regarded as meeting only temporarily the requirements of a College of Pharmacy such as this College should develop into. Before another decade has passed, the College should occupy a much larger separate building in the medical group on the new campus. Surrounding the building or in close proximity to it should be a much larger and more representative medicinal plant garden, with all the equipment that should go with such a garden, than the present garden can possibly become where it is located.

The legislative appropriation now available will supply such equipment as the College will need in preparing Millard Hall for use, but the present most urgent need is an enlarged Faculty. Two full professors and several assistant professors and instructors should be added as soon as the larger quarters admit of the organization of the four-year undergraduate course and the postgraduate course authorized by the Regents some years ago, but which have not been instituted because of the lack of room, equipment and instructional forces. In due course a number of subjects now taught in other departments of the University and which rightly should be a part of the curriculum of the College of Pharmacy should be taught within the College itself. A pharmaceutical museum should be included in the future development of the College. The College should be placed in a position to engage in some much needed research work and to publish regularly the results of this research work.

Respectfully submitted,

FREDERICK J. WULLING, *Dean*

THE SCHOOL OF MINES

To the President of the University:

SIR: I herewith submit my report as Dean for the year 1911-12.

Historical.—On January 15, 1887, the General Faculty of the University of Minnesota recommended that the Board of Regents establish a "College of Mines and Metallurgy." On May 24, 1887, the Board of Regents voted that the Faculty be authorized to give such instruction in mining and metallurgy as the interests of education may demand. On December 18, 1888, a committee of three was appointed to consider the expediency of establishing a "School of Mines" in the University and to report at the next meeting of the Board. Dr. Cyrus Northrop, chairman of this committee, reported March 21, 1889, and on May 4th a course of study for the "School of Mines" was adopted by the General Faculty. It was largely through the efforts of the late Christopher W. Hall, Professor of Geology and Mineralogy, that the School of Mines was established. The time and attention he gave it in its early days made possible its present strength and usefulness. The curriculum appears in the catalogues for 1888-89, 1889-90, 1890-91. Three students were enrolled in 1891 and the first class was graduated in 1894. The necessity of equipping the School and appointing a specialist in mining and metallurgy was apparent. The Board of Regents, therefore, obtained from the Legislature of 1891 "six thousand dollars for the purpose of opening the School of Mines in the University of Minnesota and furnishing same with suitable apparatus." The same Legislature appropriated "forty-five hundred (4,500) dollars annually for salaries of instructors in this school and for the salary of a Professor of Electrical Engineering." On October 1, 1891, William R. Appleby was appointed Professor of Mining and Metallurgy. He came to Minnesota January 1, 1892, and formally opened the School. In 1892 the School of Mining and Metallurgy was combined with the Engineering College forming the College of Engineering, Metallurgy, and the Mechanic Arts with Professor Christopher W. Hall as Dean. This organization continued until December 14, 1897, when the Board of Regents separated the School of Mines from the Engineering College and again placed it under control of its own faculty. In 1892 five thousand (5,000) dollars was subscribed by the citizens of Minneapolis for Ore Testing and Milling Laboratories through a committee consisting of Judge E. M. Johnson, P. D. McMillan, G. H. Warren, James R. Thorpe, and S. C. Gale. Harry W. Jones was architect for the building and donated the plans. This building was partly destroyed by fire August 28, 1902. In 1895 the Legislature appropriated "five thousand (5,000) dollars annually for the support of the

TABLE I. REGISTRATIONS AND GRADUATIONS, 1894-1912

CLASS	STUDENTS				GRADUATES		ORIGINAL FRESHMEN GRADUATING					
	Original freshmen	Entered with advanced standing	Entered from other classes	Total taking work with class	Total	Per cent based on (d)	In 4 years	Per cent based on (a)	Subsequently	Per cent based on (a)	Total	Per cent based on (a)
	a	b	c	d	e	f	g	h	k	m	n	o
				$d = a + b + c$		$f = \frac{e}{d}$		$h = \frac{g}{a}$		$m = \frac{k}{a}$	$n = g + k$	$o = \frac{n}{a}$
1894..	1	2	1	4	2	50.00	1	100.00	0	0.00	1	100.00
1895..	1	4	0	5	1	20.00	1	100.00	0	0.00	1	100.00
1896..	4	2	1	7	3	42.86	0	0.00	0	0.00	0	0.00
1897..	8	3	1	12	3	25.00	2	25.00	2	25.00	4	50.00
1898..	6	6	3	15	6	40.00	1	16.66	1	16.66	2	33.33
1899..	5	5	3	13	3	23.07	0	0.00	0	0.00	0	0.00
1900..	17	7	0	24	8	33.33	6	35.29	0	0.00	6	35.29
1901..	18	5	5	28	7	25.00	3	16.66	2	11.11	5	27.78
1902..	20	4	0	24	3	12.50	3	15.00	2	10.00	5	25.00
1903..	28	3	7	38	11	28.94	7	25.00	1	3.57	8	28.57
1904..	35	2	4	41	12	29.27	9	25.71	3	8.57	12	34.29
1905..	57	6	7	70	15	21.42	8	14.03	6	10.53	14	24.56
1906..	43	1	17	61	13	21.30	7	16.28	7	16.28	14	32.56
1907..	51	3	17	71	18	25.35	12	23.53	2	3.92	14	27.45
1908..	37	4	15	56	14	25.00	10	27.03	4	10.81	14	37.83
1909..	40	2	16	58	10	17.24	7	17.50	7	17.50	14	35.00
1910..	66	2	19	87	26	29.88	19	28.79	5	7.57	24	36.36
1911..	64	0	20	84	26	30.95	20	31.25	6	9.37	26	40.63
1912..	52	0	17	69	23	33.33	16	30.77	0	0.00	16	30.77
Totals	553	61	..	..	204	..	132	23.87	48	8.67	180	32.54

* An "original freshman" is a freshman who enters the School of Mines for the first time.]

Total number of students = (a + b) = 614.

Percentage of students graduating = $\frac{e}{a+b} = 33.22\%$.

School of Mines" and F. W. Denton was elected Associate Professor of Mining and Metallurgy. A year later the chair of Mining and Metallurgy was divided and F. W. Denton was made Professor of Mining and W. R. Appleby, Professor of Metallurgy. The students made their first mining trip to the Vermilion Range in 1896. Since that date trips have been made annually and have become the most important features of the curriculum. On December 10, 1901, a gift of five thousand (5,000) dollars was made by Mrs. Mary H. Elliot in memory of her deceased husband, Dr. A. F. Elliot. The interest from this amount is used to assist worthy young men in getting a mining education. In 1901 the Legislature appropriated forty-seven thousand five hundred (47,500) dollars for a School of Mines Building and in 1903 twenty-five thousand (25,000) dollars more was appropriated to complete and equip this building. The Legislature of 1905 appropriated two thousand (2,000) dollars annually for the biennial period. This fund was granted for the purpose of keeping the School of Mines equipped with up-to-date machinery and apparatus. The need of continuing such an appropriation has been felt for the past six years. The past ten years have been marked by steady growth, higher standards of scholarship, and moderate increase in the teaching staff. Changes in the curriculum have always been conservative and of necessity along the lines considered most desirable by the leading state mining schools. Our graduates have no difficulty in getting positions and have the very best reputation among professional men for being thoroughly trained in practise as well as in theory.

Registration.—The yearly enrollment and number of graduates are shown by the accompanying Table I. Changes in the metal market are invariably reflected in the attendance of the school. The large drop in 1909 is coincident with the imposing of entrance requirements in Mathematics. The table shows the registration in the School to date. Six hundred and fourteen (614) students have entered during the past nineteen (19) years and two hundred and four (204) have been graduated, or, thirty-three and twenty-two one-hundredths (33.22) per cent. The loss of students is shown, also the number of men who, finding it possible to return, subsequently graduated.

Table II shows the enrollment by classes, the number of men leaving and reasons therefor, for the past ten (10) years.

Geographical distribution of students.—During 1911-12 students have been registered from Minnesota counties as follows: Aitkin, 1; Beltrami, 1; Blue Earth, 1; Brown, 2; Cass, 1; Chisago, 1; Chippewa, 1; Crow Wing, 1; Goodhue, 2; Hennepin, 38; Hubbard, 1; Itasca, 1; Jackson, 1; Kandiyohi, 1; Lincoln, 1; Meeker, 1; Morrison, 1; Mower, 1; Nobles, 1; Pope, 1; Ramsey, 17; Rice, 2; Saint Louis, 8; Washington, 4; Watonwan, 1; Wright, 1. Students were registered also from outside the State as follows: Wisconsin, 3; North Dakota, 1; Brazil, 1; Peru, 1; Total, 98.

Changes in curricula.—The mining engineer must have a working knowledge of the various branches of engineering. He must be sufficiently conversant with current practice to be able intelligently to investigate such engineering questions as transportation, water supply, power,

mechanical equipment, metallurgical treatment. He must harmonize the viewpoint of the mechanical and electrical engineer, accustomed to the equipment of large permanent industrial enterprises, with the viewpoint of the mine operator who must be content with reasonable mechanical efficiency owing to limited capital, depletion of ore reserves, and the consequent temporary character of the installation. With this end in view the courses in mine plant and mine plant design have been planned and are being administered by the Department of Mechanics and Mathematics.

TABLE II. WITHDRAWALS OF STUDENTS, 1902-12

		YEAR										
		11-12	10-11	09-10	08-09	07-08	06-07	05-06	04-05	03-04	02-03	
SENIORS	Students withdrawing	Enrollment.....	24	27	26	12	15	19	13	15	12	11
		Deficient.....	1	1	..	2	1	..	..	..	..	..
		To other colleges.....	..	..	..	..	..	..	..	..	..	..
		Financial.....	..	..	..	..	..	..	..	..	..	..
		Health.....	..	..	..	..	..	..	..	..	..	..
		Unknown.....	..	..	..	..	..	1	..	..	..	..
JUNIORS	Students withdrawing	Enrollment.....	17	26	28	28	17	20	21	15	18	17
		Deficient.....	3	..	1	..	..	2	1	1	2	5
		To other colleges.....	..	..	..	3	..	1	..	..	..	..
		Financial.....	1	..	..	..	2	1	..	..	..	..
		Health.....	1	1	..	..	..	..	1	..	1	..
		Unknown.....	2	1	..	2	3	4	..	1	..	..
SOPHOMORES	Students withdrawing	Enrollment.....	14	25	37	49	43	24	40	36	31	31
		Deficient.....	4	5	2	4	7	7	16	7	10	7
		To other colleges.....	1	1	4	5	2	2	..	2	1	7
		Financial.....	1	2	3	2	2	2	..	1	1	3
		Health.....	..	1	..	1	1	..	..	1	1	..
		Unknown.....	3	1	4	5	2	1	5	3	3	3
FRESHMEN	Students withdrawing	Enrollment.....	22	12	27	61	73	75	47	41	57	51
		Deficient.....	3	1	3	5	10	13	15	7	7	9
		To other colleges.....	..	..	..	11	2	5	4	..	1	3
		Financial.....	1	..	..	3	4	1	1	1	3	2
		Health.....	..	..	..	2	1	..	..	..	..	1
		Unknown.....	..	2	1	5	12	16	..	4	25	14
FIRST YEAR	Students withdrawing	Enrollment.....	21	15	..	..	..	..	..	..	..	..
		Deficient.....	4	1	..	..	..	..	..	..	..	..
		To other colleges.....	2	..	..	..	..	..	..	..	..	..
		Financial.....	..	..	..	..	..	..	..	..	..	..
		Health.....	..	1	..	..	..	..	..	..	..	..
		Unknown.....	4	2	..	..	..	..	..	..	..	..

Metallography.—During the coming year the Department of Metallurgy will present a new course in Metallography. This branch of Metallurgy deals with the microscopic examination of metals and alloys. The physical properties of metals and the heat treatment to which they have been subjected can be determined from a study of their microstructure. Chemical analysis and mechanical tests alone are wholly inadequate. Metallography has been of interest from a purely scientific

standpoint since 1857, but only within the last ten years has its value been recognized by manufacturers and consumers of steel and other alloys. To-day the majority of large steel plants are installing metallographic laboratories. To meet the demand for high grade men, trained along these lines, the best technical schools of the country are developing courses and carrying on research work in metallography. A large steel plant is now in process of construction at Duluth. It is, therefore, important that the Minnesota School of Mines be prepared to furnish graduates to fill these positions. The course as planned will be required of candidates for the degree of Metallurgical Engineer and offered as an elective to seniors in Applied Chemistry. The course will extend for one term and will consist of two lectures per week, supplemented by four hours in the laboratory. The equipment will eventually consist of the necessary microscopes for student's work; a large photo-micrographic outfit for research work; equipment for cutting and polishing specimens; electric heating furnaces, with the necessary pyrometers for controlling temperature used in the heat treatment of metals; also equipment for producing alloys of any desired composition for examination under the microscope. In addition to the above, minor changes have been made in hours and courses of study.

EXPERIMENT STATION

Purpose of the Station.—The Legislature of 1911 appropriated for each of the years ending July 31, 1912 and 1913 the sum of ten thousand (10,000) dollars for "The School of Mines and maintenance of an Experiment Station connected therewith." The Board of Regents at a meeting held December 12, 1911, voted to establish an "Experiment Station of the School of Mines." The purpose of the Experiment Station is briefly as follows: (1) To promote the development of the mining and mineral resources of the State. (2) To assay specimens of ores, rocks, clays, and minerals free of charge, subject to the necessary regulations imposed by the Board of Regents. (3) To make mining and metallurgical experiments in the treatment of such substances and in the utilization of mining and metallurgical by-products. (4) To investigate methods of mining and the use of explosives. (5) To undertake such other work as may seem desirable. (6) To make all ore estimates for the Tax Commission and to do such other work along the lines above outlined as may be requested by the other state departments.

Co-operation has been effected with the Minnesota Geological Survey and the School of Chemistry.

Work done.—Several hundred specimens have been assayed for the citizens of the State and over two hundred (200) consultations have been held with individuals relating to their properties and mining possibilities. The object of the Experiment Station is becoming better known and the number of applicants for assistance and technical advice is increasing every day. Many requests for detailed information concerning mining operations in this State suggested the advisability of issuing a publica-

tion on this subject. Charles E. van Barneveld, Professor of Mining Engineering, has prepared a bulletin entitled *Iron Mining in Minnesota* which is now in press and will shortly be ready for distribution. The subject matter will be of interest both to technical men and the general public. The station has prepared for distribution maps on the Mining Districts of Minnesota and the Cuyuna Range. These maps will be kept up to date from year to year and others will be prepared as conditions may require. The number of requests for these maps has been unusually large. A series of tests are being made on the treatment of low grade iron ores found within the State. The results to date are encouraging. It is hoped that the State which owns large tonnages of wash ore will be particularly benefited. It is also expected that the experiments will materially assist the Tax Commission in placing a fair assessed valuation on ore lands.

Service to Tax Commissions.—The work of making ore estimates as a basis for assessed valuation for the Tax Commission has progressed satisfactorily to the members of the Commission as well as to the various mining companies; nearly one billion (1,000,000,000) tons of ore have been estimated to date. Many expressions of satisfaction received from mining companies seem fully to justify having this work done through the Experiment Station of the School of Mines by disinterested, non-partisan experts of our teaching staff.

Gifts to the School.—During the last year the following gifts were received by the School. They represent a cash value of nearly one thousand (1,000) dollars: Set of sectioned valves Lunkenheimer Company; set of sectioned valves, Jenkins Bros.; sectioned model of Marsh Pump, American Steam Pump Company; sectioned model of Cameron Pump, Cameron Steam Pump Company; sectioned Hancock Inspirator, Ashcroft Company; board of rope samples, A. Leschen & Sons Rope Company; sample beam hangers, post caps, etc., Duplex Hanger Company; No. 0 Mitchell Improved Crusher, 1912 model, Eureka Stone & Ore Crusher Company; 2¼ inch Improved Wood Rock Drill, Wood Drill Works; No. 12-A Waugh Stoper, Denver Rock Drill & Machine Company; one 500 C. P. Builders Light, Alexander Milburn Company; Collection of rare copper minerals and products from the Butte District, John A. Grimes, '08, Geologist Anaconda Mining Company, Butte, Montana; Samples of rich gold and silver bearing ore, Hon. J. F. Calhoun, Minneapolis.

Future development.—There is a great need of an increase in the teaching staff. Little or no time is at present available for special investigation. Interesting problems have to be set aside and results looked for from other schools. The School has a most efficient departmental library, but it has already outgrown its quarters. It is impossible to acquire more space as all the rooms in the building are already filled to their capacity. The Mining and Ore Testing buildings are old and are not of fire-proof construction. The equipment is fast becoming out of date. If the School is to meet the necessary demands made upon it, it must be better housed and have a greater variety of machinery and

apparatus. The present location of the Engineering Buildings and the proposed location of the Chemical Building make it desirable at the present time to consider a site for the School of Mines on the new campus. In the interests of efficiency, conservation of students' time, and economy the School of Mines should be in close proximity to the above mentioned departments and particularly to the Geological Department. The Metallurgical Department should receive special consideration. Only the most elementary kind of electro-metallurgical work is offered. As there are no equipped laboratories, no work can, therefore, be offered in the electric treatment of iron ores, a most promising and important field for research to an iron ore-producing State. No special or short courses can be offered owing to lack of room, equipment, and instructors to conduct the work.

It is hoped that the urgent needs of the School will receive attention before its usefulness has become too greatly impaired.

Respectfully submitted,

W. R. APPLEBY, *Dean*

THE SCHOOL OF CHEMISTRY

To the President of the University:

SIR: I herewith present my report as Dean for the year 1911-12.

Historical.—The School of Chemistry was organized in 1896. At that time the demands for technical and applied chemistry were so limited that it did not seem wise to offer a course in these fields. A single course was, therefore, established in analytical chemistry, for the purpose of fitting men and women for teachers, analysts, and investigators. As this work was more or less closely associated with the work in the College of Science, Literature, and the Arts, the School was affiliated with that College. In 1903, however, the School had grown sufficiently to warrant making it independent. In that year it was reorganized as the School of Analytical and Applied Chemistry. Through a marvelous development of the chemical industries of the country the demands for trained chemists so increased that it seemed wise to broaden the scope of work. Accordingly, two additional courses were offered. The three courses were as follows: (1) Analytical Chemistry (4 years), leading to the degree of Bachelor of Science in Chemistry. (2) Arts and Chemistry (5 years), leading to the degree of Bachelor of Arts and Bachelor of Science in Chemistry. (3) Applied Chemistry (4 years), leading to the degree of Bachelor of Science in Chemical Engineering.

Recent changes in curriculum.—Of the recent significant changes in the curriculum of the School may be mentioned the addition of a fifth year in the Applied Course and the arrangement of electives in all three of the courses in the junior, senior, and post senior years so that the student may specialize in any one of a score or more of different lines of industrial work. Among these may be mentioned: Gas Technology, including Coal and the Coal Tar Industry; Organic Chemistry in all its various phases, especially Sugar and Starch Technology, Food Analysis and Adulterations, and Bromatology; Physical Chemistry; Electrochemistry in all its various branches; Inorganic Chemistry; Phytochemistry; Physiological Chemistry; Photochemistry, including its technical application.

Recommendations.—Another line of work which should be considered is Agricultural Chemistry. It would seem that our students after completing the first two years should be allowed to specialize in certain subjects in the Agricultural College just as they do in Mines and Engineering. If such an arrangement could be made, I am convinced that this course would soon become one of the most important in the whole University. Such an arrangement could only be made with the approval of the Agricultural College. Another field is that of Photographic

Chemistry. The University of Minnesota has probably a better equipped laboratory for instruction in practical photography and photo-engraving than any other university in the country. We are, however, behind some of the universities of Germany. The photographic industry has grown to enormous proportions during the last decade, but, strange to say, has been very little studied from the strictly scientific point of view. The University of Minnesota has already done important scientific work in this field, but in order that this work may continue to grow additional equipment and assistance should be provided.

TABLE I. REGISTRATIONS, 1904-12

	1904	1905	1906	1907	1908	1909	1910	1911	1912
First Year.....	..	..	..	..	..	..	..	..	15
Freshmen.....	19	10	21	20	17	27	23	11	17
Sophomores.....	2	13	7	19	18	7	19	12	7
Juniors.....	8	2	17	5	13	17	8	15	18
Seniors.....	4	7	2	13	7	10	15	15	18
Unclassed.....	3	..	..	3	13	19	18	20	6
Total.....	36	32	47	60	68	80	83	73	81

Geographical distribution.—Students were registered from counties in Minnesota as follows: Aitkin, 1; Brown, 2; Chisago, 1; Crow Wing, 1; Fillmore, 1; Goodhue, 2; Hennepin, 39; Hubbard, 1; Isanti, 1; Lyon, 2; Meeker, 1; Nobles, 1; Olmsted, 3; Pipestone, 1; Ramsey, 14; Red Lake, 1; Traverse, 1; Washington, 1; Watonwan, 1; Winona, 2; Wright, 1; and from other states as follows: Iowa, 1, and South Dakota, 2.

Conditions and failures.—In instructing 560 students the School distributed 259 conditions and 153 failures.

Subjects of students' degrees.—1. Relation of Oxygen, Free and Albuminoid Ammonia in Waters after Standing. 2. A Study of the Yttrium Group with the Purpose of Separating Out Erbium as a Pure Salt. 3. The Velocity of Ionic Reactions. 4. The Migration of Ions in a Closed Liquid Circuit without Metal Electrodes. 5. A Colorimetric Determination of Available Oxygen in Water. 6. Study of Minnesota Peat. 7. A Chemical Study of Lignite. Part II. The Volatile Constituents. 8. The Alkali Salts of Tribromoguaiacol. 9. The Efficiency of the Reduction of Iron Ore by Gaseous Reducing Agents, and the Effect of Catalytic Agents. 10. A Chemical Study of the Fruit of Crataegus. 11. The Use of Thio-Urea for Making Direct Positives on Glass Plates. 12. A Method of Measuring Plasticity and Tensile Strength of Green Clay. 13. An Apparatus and Method for Determining Hydrogen Sulphide in Illuminating Gas. 14. The Precipitation of Manganese by Bromine. 15. A Study of Some of the Gravimetric Methods for the Quantitative Determination of Nickel. 16. Collodion Emulsion. 17. The Use of Thiourea and Its Halide Compounds for Developing Positives on Photographic Dry Plates. 18. The Bromine and Brom Ethoxy Compounds of Phenanthrene.

19. Rare Earths. 20. Corn Oil. 21. Narcotine. 22. Volatile Combustion in Coal. 23. Phenanthrene and Some of its Derivatives. 24. A Study of the Reactions Which Take Place when Potassium Bichromate and Ammonium Chloride are Heated. 25. Camphoroxime. 26. Some Special Form of Apparatus Devised to Facilitate the Use of Fehling's Process. 27. A New Form of Apparatus for the Determination of Vapor Pressures and Vapor Compositions. 28. The Preparation of Calcium. 29. Wyoming Ores. 30. A Chemical Study of Veratrine. 31. The Reaction of Ammonia Compounds with Chromyl Chloride and Chromic Anhydride. 32. Prep. of 2-5 Dimethylbenzyl, 2:5 Dimethylbenzalhydrozone and Its Benzoyl and Acetyl Derivatives. 33. Quantitative Determination of Limestone. 34. Ferrocyanides, especially of Aluminum. 35. Wet Plate. 36. Pyridine: Its Constitution and Derivatives. 37. A Chemical Study of Rhus Glabra. 38. A Chemical Study of Wheat. 39. Acetylene. 40. Colophonium of the Northern Pine. 41. A Study of the Terpenes from the Stumps of the Norway Pine. 42. The Comparison of Rapid Electro-Analytical Methods. 43. The Efficiency of the Reduction of Iron Ore by Gaseous Reducing Agents, and the Effect of Catalytic Agents. 44. The Reduction of Iron Ore. 45. Quinoline. 46. Alkaloids. 47. An Amine Compound of Gold. 48. A Method for the Determination of Nitrates in Water. 49. Veratrine and Some of Its Iodides. 50. The Condition of Oxidation of Manganese when Precipitated by the Bromine Process. 51. Electrolysis of Benzile. 52. Nucleation of Pure and Mixed Vapors in Dust-Free Air. 53. A Chemical Study of Mullein Seed. 54. Modification of the Picric-Acid Method for the Determination of Nitrates in Water. 55. A Study of the Electrolytic Determination of Zinc and Copper with the Mercury Cathode. 56. Some Chlor-Derivatives of Pinene. 57. Reaction between Ammonium Chloride and Potassium Bichromate. 58. Contributions to the Knowledge of Narcotine and Narceine. 59. Eugenol. 60. Firpene and Pinene. 61. The Spectroscope. 62. The Condition of Oxidation of Manganese when Precipitated by the Bromine Process. 63. A Review of the Work Done on Spectrum Photography. 64. A Study of Quebracho Extract. 65. Coniferin. 66. Effect of Freezing and Drying of Sugar Beets. 67. The Establishment of the Constitution of 3, 6 Dimethylbenzaldehyde, and the Preparation of Some of Its Derivatives. 68. A Study of Camphoroxime. 69. Portland Cement.

Respectfully submitted,

GEORGE B. FRANKFORDER, *Dean*

COLLEGE OF EDUCATION

To the President of the University:

SIR: I herewith submit my report as Dean for the year 1911-12.

Historical.—The University of Minnesota first offered courses for prospective teachers in 1885-1892, the lectures being given by Harry P. Judson, Professor of History. From 1892 to 1899 a teachers' course of two years was conducted by David L. Kiehle. In the latter year this course was reorganized as a Department of Education in connection with which the University Teacher's Certificate was granted to graduates of the College of Science, Literature, and the Arts. In 1902 George F. James was selected as the head of the department. The College of Education was authorized by the Legislature of Minnesota in 1906 to afford a training for prospective high school teachers, principals, and superintendents. It offers a two-year course of study, leading to the degree of Bachelor of Arts (in Education) to those who have completed two years of collegiate study. The Faculty was developed out of the former Department of Education by the addition of a Professor of School Administration, a Professor of the History of Education, together with the co-operation of the Department of Philosophy for the teaching of psychology and of other departments in the College of Science, Literature, and the Arts for instruction in the methodology of the various high school studies.

Enrollment.—In continuing the work of the former Department of Education, the College offers instruction each year to more than three hundred students in the Colleges of Science, Literature, and the Arts and of Agriculture and in the Graduate School. Its own enrollment may be partly indicated by the membership of its graduating classes which has increased from 4 in 1907 to 40 in 1912. The junior classes have grown in the same proportion and the College now numbers 87 students of junior and senior grade.

Scholarship.—Students are not admitted to this College unless they have a good average of scholarship for the first two years of collegiate study and, if they come from other institutions or enter with advanced standing from Minnesota State Normal Schools, they must have the special recommendation of the president. It is not surprising, therefore, that of all the students enrolled to date practically none have failed of graduation on account of deficient scholarship.

Geographical distribution.—Only one student came from outside of Minnesota this year, but the counties of this State were represented as follows: 39 from Hennepin, 5 from St. Louis, 4 from Ramsey, 3 from Blue Earth, 2 each from Cottonwood, Morrison, Chisago, and Ottertail, one each from Norman, Houston, Douglas, Steele, Bigstone, Freeborn, Pipestone, Stearns, Koochiching, Hubbard, Waseca, Fillmore, Brown, Wright, and Grant.

The needs of the College.—Minnesota is providing in her State Normal Schools an excellent training for elementary teachers and is developing in connection with her public high schools facilities for the preparation of rural school teachers. No adequate means have been organized so far for the professional training of the men and women who are needed in the teaching and management of schools of secondary grade.

The University High School.—The practical training of future high school teachers is conditioned by the opportunity for teaching and directing classes under careful supervision. The vital center of every training school for teachers is in the practice and observation classes. For this reason the College opened some years ago a model or practice school which has developed into a six-year high school which receives pupils from the seventh to the twelfth school year. Working under the most restricted conditions, limited in numbers, housing, equipment, and teaching force, the school has nevertheless proved of the greatest practical value. The greatest need of the College is for a well-equipped high school sufficiently large to afford the opportunity of observation and practice to all the students who are preparing for secondary teaching. The University of Wisconsin is just completing a \$150,000 building devoted solely to this purpose. An additional professor of the practice of teaching is needed as supervisor of this work.

The training of school superintendents.—During the last few years the College has been receiving an increasing registration from men experienced in school work who desire a preparation for more advanced and responsible positions. Many more men and women have gone each year from Minnesota to other states at an unnecessarily large expense because their needs have not been recognized in their own University. The harmonious development and administration of a state system of public instruction calls for the best possible education in home schools of the men and women who are to be the leaders in this work. The Faculty of the College should be enlarged by the appointment of a specialist in secondary school organization.

Special teachers and supervisors.—The superintendents of Minnesota schools have for several years urged the University to provide them with teachers and supervisors of drawing, music, physical culture, manual and commercial training, household arts, and agriculture. At present for teachers of most of these subjects Minnesota must turn to other states and in too many cases to training schools which are organized for money-making purposes primarily and which afford only an inferior training and that at very considerable expense. This College should be enabled to meet the requirements of Minnesota for teachers of these types. Special instructors in these lines should be added to the Faculty and they should be assigned to teaching in the high school, to the supervision of practice teaching by the college students, and to the conduct also of courses within the College in the history and theory of their respective branches.

A school survey.—We are only now beginning to recognize that the first step toward school improvement depends on an accurate knowledge of school conditions. This College should be co-operating in very definite

ways with other educational agencies of the State to find out what Minnesota has and what she needs in her system of public instruction. The College should be a center of investigation into the actual facts and a clearing-house of information for the benefit of schools throughout the commonwealth. This means a larger teaching force for the College, but it calls also for the establishment of a number of fellowships and assistantships for advanced students who may through their special investigations do a valuable work for the State in the course of their own preparation for later positions of responsibility.

The problems of the School.—Educational ideals are rapidly changing. School practice is being radically modified. The problems of the school are taking on entirely different aspects. The University should through its College of Education lead in the investigation of such fundamental questions as the nature of the curriculum, the fashioning of the course of study, the development of text-books more in accord with present needs, the definition of various types of schools and their welding into a unified system. This responsibility has long rested upon the University. It is now time to recognize and to meet it.

School inspection.—The official inspection of Minnesota schools is rightly placed under separate direction, but the University can help greatly in the work of the public high school if its graduates who go into secondary teaching are kept in touch with their Alma Mater and receive from her a constant guidance and inspiration. To this end the Faculty of the College should be enabled from time to time to visit the schools where their former students are at work, since in this way they can give timely help while at the same time they are themselves receiving the advantage of first-hand contact with the conditions which they must constantly have in mind for their own college teaching. A traveling fund for this purpose should be continued and somewhat increased.

An appointment bureau.—The Faculty of this College has always exerted itself to promote the welfare of graduates through their appointment to the kinds of positions in which there have appeared in each case the best opportunities for successful service. The greater part of the work is done in a few months in the latter part of the college year, but much better results can be secured if arrangements can be made for giving expert attention throughout the twelve months of each year to the appointment of the graduates of the University to the vacancies which are constantly arising, not merely in the schools but in allied forms of social endeavor.

Summary.—The College needs a building for its own work and that of the University high school, the appointment of specialists in secondary education, the practice of teaching, the fine, industrial, manual and household arts, additional teachers in the high school to care for much larger classes, fellowships for advanced students and clerical help for the rapidly growing details of college administration.

Respectfully submitted,

GEORGE F. JAMES, *Dean*

THE GRADUATE SCHOOL

To the President of the University:

SIR: I herewith submit my report as Dean for the year 1911-12.

Historical.—This School offers graduate work leading to the higher degrees of Master of Arts, Master of Science, Doctor of Philosophy, and Doctor of Science. The degree of Master requires at least one year of work beyond the Bachelor's degree, and that of Doctor at least three years. The University conferred its first Master's degree in 1880, since which time it has granted some 310 such degrees besides those granted in law; and of these, 250 were granted during the last 10 years. The statistics of these 250 are compiled in Table I, from which it will be seen that somewhat more men than women received the M.A. degree. This degree has been sought for mostly with one or other of the following objects in view: either as a professional degree preparatory to teaching, or as preliminary to a Doctor's degree. Most of the women who study for this degree do so for teaching purposes. Of the 40 degrees of M.S. granted during the 10 years, three only were to women. The first Doctor's degree was conferred in 1888, and since then 55 such degrees have been granted in all, 26 of them during the last 10 years. Table I contains statistics of this degree also for the last ten years, during which time but one woman has received such degree. The degree is one given on the basis of original investigation made by the candidate. Of these 26 degrees 14, or more than half of them, were in the domain of the biological

TABLE I. DEGREES CONFERRED, 1903-1912

	1		2	3	4	5		6	7
	M.A.		M.S.	Ph.D.	FIRST DEGREE		Totals		
	Men	Women			In Minn.	Elsewhere			
1903.....	10	10	1	3	16	8	24		
1904.....	10	5	1	3	13	6	19		
1905.....	6	7	1	3	15	2	17		
1906.....	7	9	2	2	13	7	20		
1907.....	14	6	4	2	20	6	26		
1908.....	15	6	2	3	20	6	26		
1909.....	16	14	6	5	32	9	41		
1910.....	11	16	7	1	24	11	35		
1911.....	15	11	7	2	28	7	35		
1912.....	11	10	10	2	28	5	33		
Totals.....	115	94	41	26	209	67	276		

3 In this column is included one degree of Master of Forestry and several of Master of Science in Agriculture.

4 In this column is included one Sc.D.

and physical sciences. These Doctor's degrees constitute not more than 10 per cent of all the higher degrees granted, and are rightly regarded as the highest academic distinctions open to students of the University. Columns 5 and 6 show how many of those receiving higher degrees during the last ten years received their first degrees from one or other of the various colleges within the State of Minnesota, including the University itself. It appears that only one-fourth came from outside the State, which is probably a much smaller proportion than will be found in the graduate schools of most other state institutions.

Interpretation of statistics.—Besides students enrolling as candidates for degrees of Master or Doctor, there are many desirous of pursuing graduate work along various special lines beyond the Bachelor's degree, but without any intention of attaining a degree. The majority of these are women. The statistics of the attendance of these graduate students together with those of candidates for Master's and Doctor's degrees are set forth for the last ten years in Table II. The relatively small enrollment for Ph.D., after the first three years, is due to the enforcement of definite probationary requirements since that time, which, had they been in force during those three years, would have changed the classification of applicants during that period. This degree has attained a somewhat fixed status in American universities only comparatively recently. It appears from columns 4 and 5 that the average number of men in the School has been nearly double the number of women. By comparing the total number of Master's degrees (250) with the total attendance of candidates for that degree (624), it would appear that over 40 per cent of those entering for that degree received it. But in case of those entering for a Doctor's degree it is far otherwise. Taking the last 7 years for a just basis of comparison, it appears that of those entering for Ph.D. about 1 in 6 receive it. It appears further that the average attendance has been nearly 125 per annum during the decennium. It has remained practically stationary, while the institution as a whole has increased in its total attendance from about 3,800 to about 6,600.

TABLE II. REGISTRATIONS, 1903-1912

	1 Master	2 Doctor	3 Grad. Study	4 Men	5 Women	6 Totals
1903.....	64	37	35	92	44	136
1904.....	49	45	23	82	35	117
1905.....	57	41	25	75	48	123
1906.....	60	10	40	73	37	110
1907.....	55	10	30	60	35	95
1908.....	60	12	35	74	33	107
1909.....	73	19	35	78	49	127
1910.....	67	18	43	78	50	128
1911.....	60	18	68	96	50	146
1912.....	84	21	54	101	58	159
Totals.....	629	231	388	809	439	1248

Causes limiting graduate study.—There are several reasons which help to account for this fact. The situation as to graduate work in the larger universities of the country is one of keen and increasing competition for students, manifested by the founding of numerous scholarships and fellowships open to those desirous of pursuing graduate work. The larger universities by offering fellowships of \$500 each (more or less) in large numbers, have greatly stimulated their graduate work. The number of fellowships we have at our disposal to offer are so few (four or five) that students who would otherwise be glad to stay with us feel compelled by these pecuniary inducements to avail themselves of the opportunities for self-support thus freely offered elsewhere. Aside from this reason, the newness of this University has not as yet permitted the accumulation of library and laboratory facilities to such an extent as exist at older institutions. Again, by reason of the rapidity of the expansion of the regular undergraduate work during the years just past the institution has been constantly undermanned, and so the Faculty has not had leisure to devote itself in any large way to graduate work. Furthermore, previous to the last Legislature, no appropriations have been made to foster the Graduate School. It has therefore come about that the Graduate School has, in the face of these difficulties and limitations, found itself unable to do more than attempt to satisfy, as efficiently as it could, the direct demands for service made upon it, without in any way stimulating such demands or attempting to enter the field of competition with other institutions. There is still another reason which has had its effect in restricting the attendance, viz., the increasing stringency of the rules which have been enforced regarding admission to candidacy for the higher degrees. For one thing, it has been common until very recently to allow much graduate work to be done *in absentia*. That has now been practically abolished. Not only has greater rigor been exercised recently in scholastic requirements for admission to candidacy, but greater uniformity and stringency have also been enforced in the work for the degrees. All these restrictions tend to reduce the number of candidates and raise the standard to a high level.

Recently adopted regulations.—A very thorough-going and time-consuming movement to improve conditions in this particular has taken place during the past year and its results are set forth in full in the new regulations published in the current bulletin of the Graduate School. This movement was initiated with the view of putting the question of the status of the Master's degree on a more satisfactory basis, a question about which the faculties of many of the universities of the country have been much exercised recently.

The Master's degree.—A generation or more ago it was customary for colleges and universities to confer the Master's degree "in course" upon their bachelors, three years after graduation, without any requirement of study. More recently, the requirement has been one year of "liberal study" beyond the Bachelor's degree without very stringent requirements as to examinations or attendance. But of late no such laxity has been allowed. This University has during the incumbency of the present

dean offered the degree of Master of Arts on two different bases; first, for one year of advanced liberal study spread over several subjects, and, second, for a year of specialized study preparatory to the Doctor's degree. The regulations just put in force have done away with all except this last kind of Master's degree, and require the candidate to take the initial steps of original investigation such as carried further would lead to a Doctor's degree. The enforcement of these regulations will tend to confine our higher degrees to the field of the biological and physical sciences more exclusively than at present. A different solution of this question has just been adopted at Yale University where the degree of M.A. is to be conferred hereafter, not as a preliminary to a Doctor's degree, but after a course of at least two years of study in residence, in which the applicant has exhibited high attainments in some branch of learning. This accords more closely with the idea historically associated with M.A., and makes a course parallel to, but different from, that for Ph.D., as signified by the word *learning*, as distinguished from *research*. After some consideration it is my present opinion that the University will feel compelled through its Graduate School to make more adequate provision than at present to recognize and honor scholarship and learning as such, a position in favor of which the traditional ideal of university life speaks. It must be acknowledged, however, that the great and fruitful field for advanced work in a new state university like ours, where great accumulations of the culture of past generations are not as yet to be found, lies in the investigation of the material world around us, in plant and animal life, in rocks and animals, in the forces of nature, in their development and applications, and in studying the political and economic aspects of modern life, rather than in delving in the lore of the ages. However, those here set to keep the lamp of culture bright will hardly be content to be discriminated against in any way, as perhaps the present regulations may be taken to do.

Responsibility of the University.—In 1908 this University was admitted as a member of the Association of American Universities, an organization of twenty-two of the foremost universities of this country for the purpose of agreeing upon, and carrying into, effect the policies and standards that should prevail among its members. Membership is based upon two conditions: first, the existence of a strong Graduate School; second, that their professional schools of law, medicine, etc. shall require one or more years of preparatory study of college grade for entrance. This association, which is recognized in Europe as the official mouthpiece of university authority in this country, has thus made it plain that an institution which does not foster its Graduate School is not to be regarded as fulfilling its mission as a university in the real meaning of that term. It therefore becomes us to look to it that we employ such means as will secure this end. We need self-examination on this point because the statistics published annually of the number of Doctor's degrees conferred by the other universities of the Association show that when we take into consideration the actual size of this University, it stands at the bottom of the list, although two or three of the smaller universities have actually conferred

fewer doctorates than we have for a few years past.* As before stated, our Graduate School has not materially increased while the University has nearly doubled. This means that we have been suffering from a continuously decreasing percentage of graduate study, so that while this work has grown greater elsewhere it has lost ground here.

Needs of the Graduate School.—Besides the several reasons adduced previously to account for this fact it seems but right to consider somewhat further the conditions that confront us. These are in brief: a very much larger increase in the younger and more inexperienced part of the Faculty than of those of the rank of full professors or assistant professors. This of itself puts a large additional burden of supervision and executive work upon the older men. It thus has come about that the members of the Faculty who are fitted to do the most advanced graduate work find themselves so absorbed in necessary routine as not only to be estopped from engaging in research themselves, but also from directing students along lines of productive scholarship. The remarks made thus far respecting the Graduate School have been principally directed to considering the graduate student, but the real problem is perhaps more concerned with the Faculty than with the student, for, if the members of the Faculty are ardent investigators themselves, if they are given adequate salaries, if they are freed from time-consuming routine and committee work, if they have control of their time and command of facilities, they can then attract and hold graduate students and build up in time a successful graduate school. It is the easiest and most natural thing in the world for the college professor to drop a research in which he is engaged if the pressure of ordinary duty seems to require it. But when that pressure relaxes, it is usually quite impossible for him to take up again the advanced work where it has been dropped. The inspiration that was carrying him onward to new views and new insight into truth has gone out and been quenched like a spark which can never be made to glow again. In order to prevent such fatal interruption of processes of investigation more men of experience and responsibility should constitute the faculties, and the necessary administrative duties should be widely distributed in order that they may not be too burdensome for any. The scheme of seminar work inaugurated during the past year in the Graduate School devised as a method of suitably apportioning and distributing graduate work had this end in view, but it will depend for its success upon an adequate supply of able professors in each department. Salary, recognition, promotion, and opportunity for advancement should depend largely upon success in fields of original effort, which should be participated in by all members of the Faculty. More valuable work of this character is usually to be expected of professors whose duties comprise a reasonable amount of other work than if they should be allowed to devote exclusive attention to research.

Influence of a graduate school.—Perhaps the most important result

* See "Doctorates Conferred by American Universities," *Science*, Aug. 2, 1912, in which by mistake Minnesota is credited with 12 doctorates for 1912 instead of the correct number 2.

after all of a successful graduate school is the vivifying influence it exerts upon the rest of the university, and the atmosphere it creates of direct and vigorous attack upon all matters that occupy the attention of student and faculty alike, which gives reality and vivid impression of actuality to all subjects treated. The great criticism urged against university life as a whole has been its loss of touch with reality. Research, original investigation, and discovery of truth are the antidotes of all this, and the graduate school is the place where this medicine may be most effectively applied.

Respectfully submitted,

HENRY T. EDDY, *Dean*

SUMMARY OF REPORTS ON RESEARCHES RECEIVING AID
FROM FUND FOR RESEARCH AND PUBLICATION, 1911-12

Budget 119A. \$200.00.—Frederic Bass: Problem, Ventilation. System with individual air ducts installed in room in Jackson School. Only one-third usual quantity of air used. No adequate test made as yet as to efficiency. Published in *Metal Worker, Plumber, and Steam Fitter*. (N. Y.)

Budget 119B. \$20.00.—Oliver Bowles: Problem, Study of Opaque Ores in Reflected Light. Minor apparatus purchased. Results so far simply indicate the most promising way of attacking the problem.

Budget 119C. \$200.00.—Hardin Craig: Problem, York Plays and Ludus Conventriac. Money spent for photographing manuscripts in British Museum. Material received at close of year, and no work possible.

Budget 119D. \$250.00.—H. Downey: Problem, Blood of Vertebrates. Money spent for research assistant. Study of Lymph Glands in Hodgkin's Disease carried as far as material obtainable would permit. Investigation of the Origin of the Mast Granules of the Histogeneous Mast Cells of Mammals completed, and manuscript in preparation. Investigation of the Origin of Blood Platelets completed and manuscript ready to be sent to a German periodical.

Budget 119E. \$200.00.—Daniel Ford: Problem, Heywood's Plays. Owing to illness, work could not be carried on, and the fund has been reallocated.

Budget 119F. \$25.00.—F. F. Grout: Problem, Processes in Enrichment of Ore Deposits. Experiments started, but reactions must be watched a year or more before definite results are possible.

Budget 119G. \$250.00.—J. B. Johnston: Problems, Cerebral Cortex and Mechanism of Correlation in Central Nervous System. Only \$88.50 expended, as an experienced assistant was not available. Paper on the Telencephalon in Cyclostomes completed and published in the *Journal of Comparative Anatomy*, 1912, p. 341-404, 41 figures. A paper on Teleostean Forebrain completed and to be published in the *Anatomical*

Record. A paper in preparation on the Morphology of the Septal Region and Pallium in Reptiles and Mammals.

Budget 119H. \$75.00.—Frederick Klaeber: Problem, Beowulf. A paper on the Christian elements in the Beowulf has been completed and accepted for publication by *Anglia*. In addition, a brief paper has been published in *Anglia Beiblatt*, Vol. 2, No. 12, and a review in the *Journal of English and German Philosophy*, Vol. 11, No. 2.

Budget 119I. \$102.00.—A. F. Kovarik: Problem, The Absorption of the Beta Rays from Radioactive Substances. Money expended for apparatus. The work has been completed on the rays from three of the radioactive substances, and a preliminary paper was read before the American Physical Society last December, and an abstract published in the *Physical Review*, Vol. 34, p. 142. The work is being continued.

Budget 119J. \$200.00.—F. P. Leavenworth: Problem, Nebulae in Lyra and Orion. It was not possible to get a research assistant, and a reallocation of the fund has been made.

Budget 119K. \$350.00.—T. G. Lee: Problem, The Earlier Stages of Mammalian Development. About \$30.00 has been spent for material, and \$40.00 for an assistant. It was not possible to get a competent assistant. Some progress has been made.

Budget 119L. \$250.00.—H. F. Nachtrieb: Problem, Ganoids. Material could not be obtained. Reallotment has been made.

Budget 119M. \$125.00.—W. Notestein: Problem, Nicholas Notes and Verulam MSS. \$22.50 was spent on photographs of these notes, and it was decided not to photograph the Verulam. The notes have been translated and, with other material to be obtained this year, will be published in book form.

Budget 119N. \$450.00.—E. V. Robinson: Problem, Development of the Industries in the Northwest. \$328.50 has been spent on source material and research assistant. A series of maps has been completed concerning the industries of Minnesota, and these are ready for publication.

Budget 119O. \$300.00.—W. A. Schaper: Problem, The Commission Form of Government. Many municipal documents collected, and two conferences of the National Municipal League were attended. Work to be completed and ready for publication in about one year more.

Budget 119P. \$700.00.—F. R. McMillan: Problem, Investigations of Reinforced Concrete. Money has been spent for getting together required apparatus and test specimens.

Budget 119Q. \$120.00.—E. T. Bell: Problem, Fats and Lepoid Substances in Animals. A paper nearly completed on Fatty Metamorphosis of the Kidney.

Budget 119R. \$85.00.—H. E. Robertson: Problem, Cirrhosis of the Liver. Progress has been made but work necessarily can not be completed for some time.

Budget 119S. \$100.00.—R. H. Mullin: Problem, Serum Reactions. Some progress has been made, but no money expended on the research. Reallotment made.

Budget 119T. \$100.00.—J. F. Corbett: Problem, Certain Surgical Problems of the Kidney. A paper on Changes in the Kidney Resulting from Tying the Ureter has been completed and published in the *American Journal of Medical Science*, Vol. 144, p. 568. A second paper on Blood Vessel Anastomosis was completed and published in the *Journal-Lancet*, October 1, 1912.

Budget 119U. \$250.00.—J. B. Miner: Problem, Mental Examination of Children. Efforts spent in devising a series of group tests to save time in selecting exceptional children in a school room. Over 500 children examined, and the calculation of results is in progress.

Budget 119V. \$150.00.—J. Zeleny: Problem, The Electrical Discharge from Liquid Points. But \$59.50 has been expended, as a research assistant could not be obtained. A paper is in preparation on work so far completed, and will be published in the *Physical Review*. Preliminary results were presented before the American Physical Society in December.

Budget 119W. \$100.00.—G. B. Frankforter: Problem, Alkaloids. \$38.40 has been spent, partly in repair of an instrument.

Budget 119X. \$350.00.—A. E. Jenks: Problem, Ethnological Survey. Study of amalgamation begun, and paper on Ethnic Census of Minneapolis published in *American Journal of Sociology*.

Budget 119Y. \$150.00.—W. E. Brooke and B. L. Newkirk: Problem, Gyroscopic Stability. Work was continued and progress made, but no money expended. Reallotment made.

Budget 119Z. \$50.00.—H. A. Bellows: Problem, Edition of Elder Edda. Work complete and ready for the press.

REPORT OF THE DEAN OF WOMEN

To the President of the University:

SIR: The Dean of Women begs leave to submit the following report:

Historical.—The connection of women students with the University of Minnesota is, happily, a matter affording little history. So far as the writer knows, there has never been any question of the right of women to receive instruction at this institution; and possibly because coeducation has been here accepted so much as a matter of course, it has never been marked by antagonism on the part of the men or by aggressiveness and self-consciousness on the part of the women. As the University has developed, however, three periods may be distinguished as marking certain differences in the opportunities it has offered women. So long as the College of Science, Literature, and the Arts numbered less than a thousand students, it had some unity as a college. Its students knew one another and were well known by the Faculty. Students from out of town lived in the homes of East Minneapolis families. A woman coming here at that time easily claimed her share in the social life of the institution, and had unconsciously the protection which exists in a small, intimate community. As numbers increased, however, a second period began. The boarding and lodging house, managed for gain and responsible to nobody, came upon the scene. A woman student at the University might live in complete isolation, gleaning from the college life only the benefits of the class-room; or she might, if she were unfortunate in her choice of a lodging house, suffer an absolute loss in refinement and in standards of behavior. The Young Women's Christian Association was the only organization which attempted to gather the women together. A third period was heralded when women connected with the Faculty made an effort, finally resulting in the formation of the Woman's League, to bring women students together in freer companionship. Agitation for a building began; and in the spring of 1906 the Regents accepted from the late Thomas H. Shevlin the sum of \$60,000 to be used in the erection of a building for women. In the spring of 1907 a Dean of Women was appointed to have general oversight of the women students.

Important tasks.—Four lines of activity suggested themselves at once. 1. It was essential that there should be some supervision of lodging houses. Among fifty or more homes visited five years ago by the Dean of Women there was but one which made it a rule to receive only women. Men and women students occupied the same houses; and in many cases the woman of the house was too busy or too ignorant to give any attention to the social regulation of her establishment. Often no room was available in which callers might be received; and it was the general practise

to furnish bedrooms with couches instead of beds so that students might entertain their callers in their rooms. For three years an effort was made to improve conditions and to educate public sentiment by supplying a list of the houses which rented rooms only to women and which provided a reception room. Two years ago it became possible to require every woman who lived elsewhere than in her own home, Sanford Hall, or a house on the approved list to have the special permission of the Dean of Women; and it may be said that segregation is now practically complete. The erection of Sanford Hall has made much easier the establishment of a code for the lodging houses.

2. It seemed desirable that for a time the Dean of Women should oversee the finding of employment for self-supporting students. Most of the women thus aiding themselves take care of children or do housework in a small family in return for board and room. A necessary part of the function of the Dean of Women is to guard these students against injury by overwork, and sometimes to obtain loans from the Gilfillan Fund or from private persons for those whose college work suffers from the strain of outside duties. Four scholarships and scholarship loans have been founded to meet such need. (a) The Minneapolis College Woman's Club Scholarship, \$150 annually. (b) The St. Paul College Woman's Club Scholarship, \$100 annually, preferably given two years in succession to the same student. (c) The New England Women's Scholarship Loan, \$100 annually, given preferably to a student of New England birth or descent. (d) The Maria L. Sanford Scholarship Loan Fund. This fund is in process of establishment.

3. In dealing with so large a body of women, it seemed necessary to bring about as much unity of feeling as possible, so that public opinion might aid in the spread of good influences. To this end the large organizations which are open to all, such as the Woman's League and the Young Women's Christian Association, have been utilized as much as possible, and have been encouraged to concern themselves with undertakings in behalf of the University. Shevlin Hall has been controlled by student government expressed in a constitution, and administered by an executive committee composed of seven students, the Dean of Women, and the Head of Shevlin Hall. For several years this committee has published monthly a little bulletin, called *The Shevlin Record*, designed to keep women students informed of matters of interest to them. In the activity of this committee began the agitation which led to the establishment of a student council in the College of Science, Literature, and the Arts, and, recently, in the entire University. These efforts to unify the women students and to make them feel a responsibility for the welfare of women in the University have met, on the whole, with gratifying success; but such work can never, of course, be completed, nor can its results be satisfactorily tabulated. Shevlin Hall has been of incalculable service in bringing the women students together, and in giving them an opportunity for helpful companionship. About four hundred lunch there daily. Meetings of all kinds are held there. Numerous "spreads"—six o'clock suppers, costing from twenty-five to thirty-five cents a plate—are given

there by women of the different classes and organizations; and a group of twenty girls by the payment of a nominal fee may secure the building for the evening entertainment of their friends. Such entertainments must, of course, be properly chaperoned, and must end at a quarter to twelve. In this way women students have the opportunity to act as hostesses with little expenditure of time or money.

4. The Dean of Women is ex-officio a member of the Committee on Students' Work in the College of Science, Literature, and the Arts. From the outset, therefore, she has been in contact with the students who came before this committee for special privileges or for discipline; and for several years her signature has been required on women's petitions for extra work or for permission to drop work. Lacking the support of the majority of the Committee in her belief that only in rarest instances should a woman student be allowed to carry more than the so-called maximum (18 hours of recitation a week), the Dean of Women has been somewhat handicapped in acting upon petitions for extra work. In the opinion of the writer, the College of Science, Literature, and the Arts deals more successfully with its delinquents than with its ambitious students. The latter we often allowed to burden themselves with a great number of courses, to the detriment of their health, their work, and their ideal of education.

Sanford Hall.—The greatest and most significant change in the life of women students in the past two years has been brought about by the opening of Sanford Hall. This building accommodates ninety students, who live in two groups or families. For the first year, \$200 was charged each student. As a deficit resulted, however, the price for board and room was raised to \$225, a trifle less than the average amount paid by students in the boarding and lodging houses of East Minneapolis. In its influence upon its residents, Sanford Hall has exceeded sanguine expectations. The development in taste, in poise, in sympathy with others, which has been evinced by many of the students who have spent two years in Sanford Hall, could not fail to impress an observer. Undoubtedly such a building should be made self-supporting, but its educational importance should never be ignored. A college hall of residence may be only a boarding and rooming place; it may, on the other hand, have a profound influence upon refinement and character.

Sororities.—Within two years it has become the rule for sororities to have houses or apartments where chapter meetings may be held and where out-of-town members may live. Two of our nine chapters now own their houses. Sorority houses constitute, wherever they exist, a difficult problem for the Dean of Women. Unless carefully regulated they often become such centers of gaiety as to be dangerous to the health and scholarship of those who live in them. Even where the best of regulations obtain, sorority houses have the great disadvantage of isolating in the most marked way the sorority members of the student body, and of tending, therefore, to be a disintegrating influence in college society. That sorority members at Minnesota are keenly desirous of maintaining a high standard of scholarship and of making additions to

their membership in a rational and unobtrusive way is proved by the constant effort of their Pan-Hellenic Association to improve conditions of rushing and pledging. The Association has recently enacted a rule that after 1912-13 no student shall be invited to join a sorority until the beginning of her sophomore year. If this rule operates successfully, it will do much to make sororities what they should be—groups of friends, rather than aggressive social organizations.

Lectures on hygiene.—This year a course of six lectures on the topic, "Youth and Society," was given for junior and senior women and was required of those seniors who were applicants for teacher's certificates. These lectures dealt largely with the hygiene of sex as it ought to be known by the teacher. So helpful and wholesome did they prove to be that a petition, signed by a large number of those who attended them, was presented to the Dean of Women, asking that a similar course be given every year. Undoubtedly the careful instruction of teachers and of all educated women in this phase of public hygiene will do much to improve the health and the moral tone of society.

Supervision of health.—The following recommendations, submitted through the President to the Board of Regents in the spring of 1912, and favorably acted upon, explain themselves. What they point to is a better defined intention on the part of the University to concern itself with the physical well-being of its women students, and to inculcate in them a genuine respect for their own health and for that of the public.

(1) That indoor physical exercise for women shall be discontinued at the end of the year 1911-12, until the time when adequate floor space, dressing rooms, and baths can be provided.

(2) That a health officer, who is trained in medicine, but who shall not engage in private practice, be appointed to have general oversight of the health of the women students, and to assume the following duties:

(a) To see that a physical examination, as thorough as possible, be given all women students at the beginning of the year.

(b) To prescribe for each student the type and amount of exercise which she should take in order to maintain herself in good physical condition. Each student should also, at this time, be warned against any form of exertion likely to prove injurious to her.

(c) To receive at regular intervals reports from each student as to her physical condition, and as to the regularity with which she is taking the exercise prescribed.

(d) To co-operate with the Woman's Athletic Association in providing opportunity for games and out-door exercise. Groups should be organized for walking, for playing tennis, for swimming, skating, and skiing. Care must be taken to see that only those vigorous enough for these sports should participate in them; over-exertion must be discouraged.

(e) To supervise the giving of instruction in hygiene to the entering class.

(f) To give sanitary inspection of lodging houses approved for women students.

(g) To receive reports of illness in Sanford Hall or in the lodging houses, and to give examination in cases for which no other physician has been summoned. The officer herself shall not give treatment.

(h) To advise the Committee on Students' Work.

(3) That the parents of each woman student from out-of-town shall be requested to name the St. Paul or Minneapolis physician whom they wish to have called in case of their daughter's illness.

NOTE.—In order to examine all women at the beginning of the year, it will be necessary for the health officer to be provided with a number of competent assistants for a month or six weeks after the opening of College. Throughout the year she will need clerical aid in keeping records and handling reports.

This plan offers the following advantages:

(1) It extends to all women students the oversight which the University has hitherto given only to new students.

(2) It avoids requiring of students a form of exercise for which we have at present no proper equipment.

(3) It associates exercise with the student's daily life, and emphasizes the value of out-of-door sports and recreation.

(4) By its system of reports and conferences, it lays stress upon individual responsibility for the maintenance of good health.

TABLE I. DISTRIBUTION OF WOMEN BY COLLEGES, 1907-1912

COLLEGE	1907-08	1908-09	1909-10	1910-11	1911-12
S. L. & A.	901	902	1019	909	1016
Agriculture.....	24	44	63	204	212
Medicine.....	13	18	18	12	9
Law.....	6	6	6	5	6
Dentistry.....	1	1	0	0	3
Chemistry.....	7	6	2	1	3
Pharmacy.....	17	14	12	9	2
Education.....	23	31	70	79	89
Graduate.....	33	49	50	50	102
	1025	1071	1240	1269	1442
Registered in two colleges	0	2	0	6	31
Total.....	1025	1069	1240	1263	1411

TABLE II. HOMES OF WOMEN STUDENTS

	ST. PAUL AND MINNEAPOLIS	OTHER PARTS OF the STATE	OUTSIDE THE STATE	TOTAL
1907-08.....	755	223	47	1025
1908-09.....	720	281	70	1071
1909-10.....	832	325	83	1240
1910-11.....	769	395	105	1269
1911-12*.....	861	383	96	1411

*In compiling the figures for the homes of women registered in 1911-12 it was not possible to take into account the graduate women (102 in number) of that year. Most of these probably were residents of St. Paul and Minneapolis.

Needed buildings.—A gymnasium for women ought immediately to be provided. This building is an absolute necessity. Its object is not to make athletes of the women students, but to furnish a center for all efforts to improve their health and to teach them how to maintain it. Without such a place in which examinations may be made, records kept, instruction given, and a stimulus afforded to love of games, exercise, and physical development, it is practically impossible for an institution to establish in its students a right ideal of bodily health and strength.

Halls of residence ought to be added one by one until the University shall be able to house all its out-of-town women students. Until the University can afford a residence to all students who apply, many parents will hesitate to send their daughters here. The University loses in that way many students who would do it credit; and, on the other hand, it fails of possible usefulness to the residents of the State outside St. Paul and Minneapolis. Only through college residences, moreover, can an institution assure its out-of-town students of the influences which, for women at any rate, are no less important than the instruction of the class-room.

General recommendations.—That the Dean of Women shall serve on the Committee on Students' Work, or shall have a similar function, in all the colleges of the University. Without such powers she can not be equally servicable to the women of the different colleges, nor can she be considered in the truest sense an officer of the whole University.

That the Dean of Women shall have all possible assistance in gaining a more satisfactory control of lodging houses. Sanitary inspection should be one of the first steps to be taken.

That the Dean of Women shall be aided in all her efforts to raise the standards of taste and conduct among women students. Minnesota women as a class are conscientious, earnest, and exceedingly amenable to good influences. They can not, however, by themselves escape the outbreak of vulgarity and lawlessness of which complaint is made all over this country, and which has either its source or its expression in much of our contemporary music, drama, and literature. To fight against these debasing tendencies and to help college women to realize their responsibility in maintaining high standards is one of the tasks of a dean of women; and in her endeavors she needs constantly the sympathy and support of the administration of the University.

Respectfully submitted,

ADA COMSTOCK, *Dean of Women*

UNIVERSITY EXTENSION

The following statements have been prepared from data supplied by the Directors of University Extension Work:

University Weeks.—During the first three weeks of June, 1912, the University organized in eighteen towns of Minnesota one week programs of lectures, conferences, and entertainments. The following organizations and institutions co-operated with the University in this enterprise: The Federated Women's Clubs, the State Art Society, the Department of Public Instruction, the State Library Commission, the State Board of Health, the State Department of Labor, the Normal Schools at Duluth, Mankato, and Winona, Unity House of Minneapolis, the University Glee Club, the University Dramatic Club, and the Minneapolis School of Music. Seventy persons participated in the public exercises and in the administration of them. Of these persons fourteen contributed their services without any compensation, forty-six served for their expenses only, while ten received expenses and small fees. The distance covered in the three circuits was seventeen hundred and twenty-four miles. Seventeen counties were reached. It is estimated that twelve thousand six hundred people attended the sessions. Nine farm-boys' camps were organized with a total enrollment of two hundred and seventy boys. The program for the week was arranged in such a way as to give each day a special character. The six days were: "Farmers' Day," "Business Men's Day," "Art and Literature Day," "Town and Country Day," "Public Health Day," "Home Welfare Day." A trained nurse spent an entire week in each town, giving two talks daily on Home Nursing, Dietetics, Care of Children, Sex Hygiene, and other important topics. The experiment was an unquestioned success. All the eighteen towns have applied for a continuation of the plan next June. Experience has shown that the number of daily exercises should be reduced, with a consequent reduction in the size of the staff. The Boys' Camps should be put on a self-supporting basis. This can be done with a small expenditure for each boy. Arrangements should be made earlier so that there will be a longer period for a publicity campaign. The northern circuits must be organized so that the distance between towns will not be so great and involve so serious an expense.

The following table (No. 1) gives some figures concerning the cost of these Weeks. The total cost was \$7,878.75, the total receipts \$5,476.18, leaving an expense of \$2,402.57 to be met out of University funds. The amount paid for railway mileage was approximately \$1,600.

TABLE I. THE UNIVERSITY WEEKS, JUNE, 1912

PLACE	RECEIPTS	HOTEL BILL	LOCAL PRINTER	INCI- DENTALS	BOYS' CAMP	NET RE- CEIPTS	DEFICIT
St. James.....	\$300.00	\$ 88.63	\$66.55	\$40.24	\$ 20.00	\$ 84.58	.....
Windom.....	362.25	109.75	26.75	43.33	.....	182.42	.....
Worthington.....	300.00	160.00	40.06	55.92	.....	44.02	.....
Luverne.....	239.50	124.50	27.85	73.76	.....	13.39	.....
Jackson.....	315.77	92.60	12.25	89.10	.....	121.82	.....
Fairmont.....	300.00	142.00	18.50	58.56	100.18	.....	\$ 18.24
Waseca.....	300.00	126.00	75.00	42.55	.....	56.45	.....
Owatonna.....	307.50	112.45	55.20	25.08	.....	114.77	.....
Rochester.....	374.03	184.65	.....	23.59	16.25	149.54	.....
Plainview.....	300.00	87.35	17.75	32.10	64.25	98.55	.....
Grand Meadow.....	329.13	65.15	20.25	88.00	98.00	57.68	.....
Red Wing.....	300.00	107.00	30.00	48.95	29.75	84.30	.....
Brainerd.....	300.00	183.15	18.50	34.53	.....	63.82	.....
Crookston.....	400.00	106.50	34.40	56.23	80.00	122.97	.....
Bemidji.....	300.00	170.75	30.00	67.19	50.25	.....	18.19
Grand Rapids.....	305.65	159.35	22.00	52.05	.....	72.25	.....
Coleraine.....	300.00	128.95	21.75	50.30	.....	99.00	.....
Cloquet.....	315.85	131.10	19.00	35.86	.....	129.89	.....

Agricultural Short Courses, Demonstration Farms, etc.—During the year twenty short courses in Agriculture, eleven short courses in Home Economics, and fifteen short courses combining these two subjects were conducted under the auspices of the University. These courses were one week in length. The total attendance at all sessions was twenty-five thousand eight hundred. Twenty demonstration farms have been operated under the direction of three men who have devoted practically their entire time to this work. Each farm is visited at least twice each month. Public demonstrations of stock judging and the spraying of mustard were given at Pipestone and Osakis.

Industrial Contests, Rural School Work.—Two men have given the greater part of their time to the organization of industrial contests in the rural schools. These have been conducted in about forty counties. Approximately fifteen thousand boys and girls have taken part. The contests include sewing, baking, manual training, and the growing of grain, corn, and vegetables. An acre-yield contest with about thirteen hundred competitors was also organized. In co-operation with the *St. Paul Dispatch*, an acre-yield potato contest was conducted in ten counties with the participation of about one thousand boys and girls. With the aid of the *Minneapolis Tribune* a similar contest in tomato growing and canning was carried through in eleven communities. This enlisted the interest of over a thousand girls. An important feature of the industrial contest has been the introduction of prizes for booklets prepared in the rural schools on selected agricultural topics. The Extension Work is to be credited with the inauguration of a plan for providing warm lunches for those who attend the rural schools. This plan has been adopted by several country schools, which have been fitted with gas plates and other equipment. The preparing of the luncheon affords an opportunity for elementary instruction in Domestic Science. Out of more than twenty teachers who have tried the plan in Douglas County all report satisfactory results. The County Fairs offer an opportunity for extension work. In the autumn of 1911 demonstration tents were

sent to fifteen county fairs. These fairs are more and more becoming educational influences in the State. The judging of exhibits is another form of service which the Extension Department is increasingly called upon to provide.

Press Service and Bulletins.—During the year twenty-four numbers of the *Farm Press News* were published and distributed to the newspapers in Minnesota and adjoining states. The following bulletins were issued: No. 19, Domestic Science in Rural Schools, Mary L. Bull; No. 20, Soil Tillage, O. M. Olson; No. 21, The Care and Management of Poultry, C. E. Brown; No. 22, Establishing an Orchard, K. A. Kirkpatrick; No. 23, Some Common Insects and Their Control, F. L. Washburn; No. 24, Seed Testing, W. L. Oswald; No. 25, Annual Pasture, Soiling, and Hay Crops, Andrew Boss; No. 26, Seed Grain, Andrew Boss and C. P. Bull; No. 27, Flax Growing, C. P. Bull; No. 28, Tuberculosis, C. Easton and C. R. Barns; No. 29, The Keeping of Dairy Cow Records, A. J. McGuire; No. 30, Marketing Eggs from the Farm, N. E. Chapman. The mailing list for extension bulletins now numbers about forty-two thousand names. For each of nine months four-page leaflets have been mailed to all the rural school teachers of the State. These leaflets are designed to arouse an interest in the study of Agriculture. Ten thousand copies were printed for each issue.

Farmers' Institutes and Clubs.—The Extension Division co-operated with the Farmers' Institutes. Two hundred and twenty-six of these were held during the year with an aggregate of six hundred and sixty-five sessions and a total attendance at all sessions of one hundred and nineteen thousand, one hundred and eighty-two. Fifty thousand copies of *Farmers' Institutes Annual* were published. This annual contained three hundred and twenty pages of practical farming articles fully illustrated. The annuals were distributed to all who attended the Farmers' Institutes. The division continued its co-operation with Farmers' Clubs and encouraged the organization of new clubs wherever possible. The division supplied these clubs with lists of timely topics for discussion. It also supplied speakers for the club meetings. The experience with the Clubs has been most encouraging and there is reason to believe that this movement has in it large possibilities.

Extension in Economics and Political Science.—During the first semester the following evening courses were conducted: Elementary Economics, Business Law (three courses), Accounting Systems (three courses), Banking Practice, Money and Credit. There was a total registration of 274 students. In the second semester, in addition to the continuation of six courses given in the first semester the following courses were conducted: Advertising and Salesmanship, Practical Economic Problems, Funding Institutions, and Investments. The registration for the second semester was 192, making a total for the year of 466. This University work in St. Paul and Minneapolis represents a duty which the University has in these larger urban centers. It is to be hoped that the number of University courses can be rapidly increased and that similar instruction may be offered in Duluth and other cities of the State,

if a demand for work of this kind either now exists or can be created. The work in Minneapolis has been aided by the co-operation of the American Institute of Bank Clerks and other organizations. It has had the friendly support of business men and commercial firms.

College of Education Extension.—The \$5,000 appropriated for this purpose has been expended to maintain: (a) a teachers' agency for the benefit of Minnesota schools and for the advantage of University graduates (about one hundred were assisted to positions at an aggregate saving to them of a large sum in agency fees); (b) to follow up the work of University graduates now teaching by personal visits where possible, with the result both of increasing the efficiency of these teachers and of strengthening the teaching of the College through the inspection of the work of former students; (c) to continue on a moderate scale the principle of correspondence study, by which for several years about forty students have been brought annually into relation with the University; (d) to send representatives to meetings of teachers and school officers throughout the State (representatives of the Department have given eighty-two addresses to an aggregate of eight thousand five hundred people and have also participated in the programs of the University Weeks); (e) to assist schools with suggestions, loan of libraries and lantern slides. Something in this direction has been done although too little money has been available for this purpose.

DEPARTMENT OF PHYSICAL EDUCATION FOR MEN

To the President of the University:

SIR: I herewith submit my report for the year 1911-12.

Organization.—The Department of Physical Education for Men, technically under the College of Science, Literature, and the Arts, with required courses for freshmen in that college, is, in a large sense, an independent department of the University because it has jurisdiction over students in all colleges. Its staff consists of a director, an assistant director, a clerk (usually a student), a locker room attendant, and a swimming pool attendant.

The chief tasks undertaken by the Department.—1. Physical examination of each student registering in the University for the first time.

2. Special personal hygiene lecture with required attendance on the part of each new matriculant, given during the first week of the fall semester.

3. Disease census card issued to each new matriculant, and the required return of this card, properly filled out, to the Department.

4. Physical examination required of each student holding a locker in the Department. (1,200 lockers.)

5. Physical examination required of all students, both of the University and the Farm, petitioning for excuse from Military Drill, Gymnasium, Blacksmithing, etc., on account of physical disability.

6. The giving of instruction in general personal hygiene to those students taking the required course in Physical Education; also, in this course, a required gymnasium attendance twice a week throughout the year, with instruction in body-building exercises, and the requirement from each student, except defectives, of a satisfactory demonstration of exercises of skill, speed, strength and endurance, including a practical knowledge of swimming and life saving.

7. The promotion of intramural sports, comprising series of interclass, intercollege, and interfraternity baseball and basket ball games, and the awarding of team and individual trophies. The promotion of all-University swimming, wrestling, hand-ball, and gymnastic tournaments. Also, the promotion of advanced gymnastics for intercollegiate competition, and the organization and direction of a gymnastic Leaders' Corps numbering about sixty students.

8. The organization and supervision of the annual Freshman-Sophomore "Class Scrap."

9. The conducting of campaigns of Physical Education by organizing societies and calling meetings for the discussion of special topics of interest to physical directors in the small colleges.

Use made of gymnasium privileges.—The number of students using the Department privileges is approximately fifteen hundred. During the indoor season, from about December 1st to about March 15th, the gymnasium, locker-room, hand-ball courts, baths and swimming pool are, during certain periods of the day, much overcrowded.

Changes and improvements.—1. Special personal hygiene lecture, given during the first part of the autumn semester, with required attendance on the part of *all* students registering in the University for the first time. 2. Physical examination required of *all* students registering in the University for the first time. 3. Intramural sports encouraged, and the promotion of a series of interclass and intercollege baseball games, and the awarding of team and individual trophies. 4. The addition of three hundred steel lockers. 5. The passing of the cane rush.

Recommendations.—1. That increased facilities in grounds, material, and equipment be provided for the promotion of intramural sports; that the Parade Grounds, when graded, be prepared for two baseball diamonds; these grounds can also be used, in season, for Rugby and Soccer football; more ground than Northrop Field and the Parade is needed for intramural sports.

2. That positive credit be allowed for required work in Physical Education, given on the basis of laboratory work, i.e., two hours for one. It is suggested that credits for Physical Education be added to the total number of credits required for graduation.

3. That freshmen in *all colleges and schools* of the University be required to pursue the course in Physical Education, twice per week, throughout the year. (The present scheme includes only freshmen in the College of Science, Literature, and the Arts and the School of Chemistry.)

4. That sophomores in all colleges and schools of the University be required to pursue the course in Physical Education, twice per week, indoors from December 1st to March 1st, and that they be required, from the opening of the autumn semester until December 1st, to participate in some form of prescribed outdoor exercise, twice per week, the outdoor work to be resumed March 1st and continued until June 1st.

NOTE.—It is proposed to classify the freshman work in Physical Education under Course A, and the sophomore work under Course B, and to allow a student who is physically fit (to be determined by a series of physical tests) to complete both courses in Physical Education in his freshman year. This scheme would require the physically unfit to pursue the courses in Physical Education for two years.

5. That students who, upon examination by the Department, are found with defective vision (without corrective glasses), defective teeth, or other conditions tending to impair health, be required to have the defect remedied within a specified time, and report back to the department for verification. (Details of requirement to be submitted later.)

6. That a physical examination be required of *each* student in the University Farm School next year, and in following years of each new matriculant. Also, that Farm students taking required athletic and gymnastic exercises be required to wear, while taking such exercise, a suitable costume other than street clothes, and that adequate bathing facilities be provided for their use after exercise.

7. That the departments of Physical Education and Athletics be combined under one head as proposed in an "Outline of a Scheme to Reorganize and Unify the Departments of Athletics, Physical Education, and Physical Culture in the University," submitted to the President in January, 1912.

8. That, on the basis of the present organization and scope of the Department, there be granted additions to the staff and increase in the salaries of members of the present staff, as specified in writing to Dean Downey, by request of the Dean.

Respectfully submitted,

L. J. COOKE, *Director*

THE MILITARY DEPARTMENT

To the President of the University:

SIR: I have the honor to submit the report of the Military Department for the college year of 1911-12.

The University of Minnesota Cadet Corps encampment was held at Fort Snelling, Minnesota, September 12 to 19, 1911. The camp was named Camp W. W. Folwell in honor of the first president of the University of Minnesota; the attendance was 218, a gain of 30 over the first encampment in 1910. The School of Agriculture encampment began September 29, and ended October 5, 1911; the attendance was 117, a gain of 100 over the first encampment in 1910.

At the encampments instructions were given in field maneuvers and target practice, and a sham battle with the Minnesota National Guard was held.

The regular routine of drill as prescribed by the War Department was given during the college year of 1911-12, embracing school of the soldier, school of the squad, company, battalion, and regimental drill, review and parades and all ceremonies that a regiment can go through.

During the second semester 1911-12 the Commandant gave two lectures, one on Field Service Regulations and one on Military Policy of the United States. Four lectures were given at the encampments by the Post Surgeon of Fort Snelling on camp sanitation.

The members of the cadet corps have the free use of the target range at Fort Snelling, rifles and ammunition are issued free to cadets who wish to shoot on the range. A great many avail themselves of that opportunity. During the 1911-12 year the Military Department turned out two expert riflemen, 5 sharpshooters, and 26 marksmen. The outdoor rifle team made fifth place on the outdoor range in the intercollegiate shooting matches of the United States.

The indoor rifle team picked out of the cadet corps did wonderfully well in taking second place on the indoor intercollegiate shooting matches of the United States.

The attendance in the Military Department of this University for the college year of 1911-12 was as follows:

College of S. L. and A.....	349
College of Engineering.....	187
College of Chemistry.....	24
College of Agriculture.....	94
School of Agriculture.....	384
Military Science Class.....	17

THE GEOLOGICAL SURVEY

To the President of the University:

SIR: I herewith submit my report as director for 1911-12.

Organization.—The Minnesota Geological Survey was allotted \$13,000 for the biennial period begun August 1, 1911. The Director assumed his duties September 15, 1911, near the close of the field season for geological work, and no field studies were attempted until 1912. Early in 1912 certain regulations were proposed and adopted by the Regents, forbidding the director and all members of the Survey to purchase or to act as agents in the transfer of mineral lands in Minnesota, or to accept fees for expert advice relating to property within the State. The relation between the officers of the Survey and the owners of property is confidential, and the regulation permitting officers of the University under certain conditions to do private work in Minnesota does not apply to the members of the Survey.

Co-operation with the U. S. Survey.—Arrangements were made in March, 1912, for co-operation with the United States Geological Survey. According to this plan each organization is to share equally the cost of field work and publication of reports, but much of the field work is to be done by the Geological staff of the University of Minnesota, and the publication and preparation of reports will fall chiefly to the Federal Survey. The responsibility and the credit for these reports are to be shared equally by the two bureaus, and the joint reports are so announced on the title pages. Parts of the editions are to be announced as University publications in co-operation with the Federal Survey, and part are to be announced as United States Geological Survey publications in co-operation with the University. The advantages of this plan are obvious, for the funds available will go twice as far, and, moreover, the Minnesota Survey will have the advantage of the criticism of scientific specialists and of map and manuscript editors. This arrangement may be terminated when unsatisfactory to either bureau, and, when desirable, publications may be issued independently by the Minnesota Geological Survey.

Other co-operative arrangements.—Arrangements for co-operative work have been made also with the School of Mines Experiment Station and with the School of Chemistry, and the co-operative plan has been followed in the matter of burning and other tests of clays. Burning tests were made for about four hundred bricklets by the Mines Experiment Station without charge to the Survey. Some forty samples were sent also to the United States Bureau of Standards, which does this work for the state organizations free of charge. For several years the

State Drainage Commission has co-operated with the United States Geological Survey in making topographic maps. The work has been done by the federal bureau, the two organizations sharing equally the expense. Although no formal arrangements were entered into by the Minnesota Geological Survey with the State Drainage Commission, Mr. George A. Ralph, the Chief Engineer, with generous interest in the geological work, requested the federal bureau to carry on their topographic work in the region of the Cuyuna Range in order that the topographic maps may be used as a basis for geological mapping of this range. A triangulation net has been extended over this region, and an accurate topographic base will soon be available for geological work which will probably be begun next summer. Accurate topographic maps are the basis for nearly all substantial survey work of a regional character, whether biological, botanical, agricultural, or geological, and we can not urge too strongly the need for the financial support of the federal topographical work in Minnesota. The Federal Government offers to do this work and to pay half the cost, and no state can afford to let the opportunity pass.

Field work.—During the field season, from about June 15 to September 15, the following geological work was undertaken in co-operation with the United States Geological Survey: (1). A geological survey of the four quadrangles in the western part of the State, in the vicinity of Herman and Bartlett. Field work completed; folio in preparation. (2). An investigation of the occurrences and uses of the clays of Minnesota. Field work completed; a preliminary bulletin will be ready for the press February, 1913. (3). A report on the building stones of Minnesota. About one-half the field work is done. (4). Map of the surface formations of Minnesota with special reference to the soils. To be completed in 1913. (5). Occurrence of road materials in Minnesota. Work begun and carried on in connection with other work. (6). (Not in co-operation with the United States Geological Survey), a relief model of Minnesota.

Other services.—In addition to the more comprehensive problems outlined above, many inquiries were answered concerning the probability of obtaining artesian waters at several places, and numerous materials forwarded from various localities within the State were examined to determine their availability for various economic purposes. The Director of the Survey made several brief trips to the three iron ranges, to the copper region near Pine City, and the reported gold discoveries near Rainy Lake, the object being to plan more intelligently the future work of the Survey.

Detailed report of surveys, etc.—1. During the months of July and August Professor F. W. Sardeson completed the field mapping of the Herman, Bartlett, Morris, and Chokio quadrangles, covering an area of 30 minutes square. Aside from the study of the structure, the problems of underground water and the superficial formations which are closely related to the character of the soils, received especial attention.

2. The investigation of the clays of Minnesota occupied the vaca-

tion periods of Professor F. F. Grout and Mr. E. K. Soper, and one-half the time of Mr. Oliver Bowles. Mr. F. M. Handy gave about three months to burning and other laboratory tests. The area from Minneapolis north was covered mainly by Professor Grout, who also assumed the general charge of the work. Mr. Grout gave especial attention to the fire clays and kaolins and to the Cretaceous clays in Koochiching County which resemble the Red Wing product. In the northern counties material for common brick was sought. Mr. Soper studied the high grade clay near Red Wing and mapped the boundaries of the Decorah shale and studied the Cretaceous shale in Itasca County. Mr. Bowles gave special attention to the New Ulm region which has a variety of good clays. Among the results of this investigation as a whole, the following are noteworthy.

a. Several geological formations were tested, and the Decorah shale, which supplies good brick material, was traced over many counties of the State and its outcrops were determined with a considerable degree of accuracy.

b. Several deposits now used have been shown to be of value over much greater areas than were known.

c. Nearly half the State is covered with a body of clay which can be used for high grade drain tile.

d. Nearly every town of 2,000 or more is shown to have a supply of clay suitable for common brick. This work has emphasized the widespread occurrence of fire clay and kaolin in the State.

e. Several hundred burning tests were made.

A preliminary report will be ready for the printer December 1.

3. Mr. Oliver Bowles devoted two months to the study of the building and ornamental stones of Minnesota. The crystalline rocks of the upper Minnesota River Valley, of St. Cloud, Mora, and Duluth were visited and studied somewhat in detail. The limestones and dolomites of the lower Minnesota River Valley and lower Mississippi Valley were also studied. In all, about 84 stone quarries were visited, and a report was made out for each, regarding geologic and economic conditions, statistics, etc. About 150 hand specimens were collected for chemical and microscopic study. It is estimated that about two-thirds of the quarries have been visited, but in addition to the remaining third, many areas of undeveloped rock are still to be studied. In connection with the stone investigation, considerable attention was given to road-making materials.

4. Mr. Frank Leverett, of the United States Geological Survey, has been engaged for the past two years in mapping the glacial formations of Minnesota, and will publish the results of his investigations as a Professional Paper of the United States Geological Survey. The results of his investigations will be available also for a map of soils and superficial formations of the State and it is proposed to publish them, at least for the northern portion of the State, as maps issued jointly by the United States Geological Survey and the Minnesota Geological Survey. Mr. Leverett has prepared a similar map of the northern Peninsula of Michigan,

which has proved very serviceable to land owners and colonists, the edition having been exhausted in a short time. The cost of this work to the State will be very small indeed, compared with the total cost, since the larger part of the work was done by the Federal Government to determine the details of the glacial history of the region of the Great Lakes.

5. Incidental to the study of the building and ornamental stones, Mr. Oliver Bowles has devoted some attention to the location and occurrence of road material in the State. A somewhat comprehensive study of this subject will be made when the problems in hand shall have been finished.

6. A contour map of the State has been drawn on a base map, with a scale of 10 miles to one inch. This contour map has been compiled by Professor E. M. Lehnerts, from railroad levels, maps of the Mississippi River Commission, United States Geological Survey, Minnesota Drainage Commission, and Minnesota Geological and Natural History Survey. This contour map will be re-drawn on a new and more accurate base map of Minnesota recently compiled by the United States Geological Survey, and a relief map of the entire State will be modeled on this base. The size of the model will be approximately 5 feet by $4\frac{1}{2}$ feet. It will show the more marked physical features of the State in some detail. This model can be colored for exhibition purposes to show geological formations, building stones, clays, soils, rainfall, temperature, etc.

Very respectfully,

W. H. EMMONS, *Director*

THE BOTANICAL SURVEY

To the President of the University:

SIR: I beg to submit the following report of the work of the Botanical Survey of Minnesota during the past two years.

Field work.—The field work for the summer of 1911 consisted primarily of a reconnaissance of the swamp region of northern Koochiching County. In addition a more detailed study was made of the development of the swamp with especial reference to reforestation and to the production of acidity in swamp soils, as well as its effect upon plant growth. During the summer of 1912 more intensive work was undertaken with the object of classifying and mapping the vegetation of representative areas in the State. The primary object of this work was to determine the relations between climate and soil and the vegetative covering, both native and cultivated, with particular reference to indicator plants and the specialization of plant production in response to local variations of climate and soil. The work in Northfield Township was carried on in co-operation with the College of Agriculture, while the work at Meadowlands was undertaken at the express request of the College of Agriculture because of the demonstration work which they were carrying on there. Arrangements were also made to co-operate with the State Forest Service in studying and mapping the vegetation of Bemidji Township, but circumstances arose which made it impossible for the two parties to work together in this area, owing to the necessity of completing soil reconnaissance in the northernmost part of the State. In addition the Willmar Township was similarly surveyed, as representing the agricultural conditions on the border-line between the deciduous forests and the prairies. This is the first work which has been done on such a scale and with such attention to detailed factors. It has resulted in a large amount of valuable material, in addition to the 146 maps giving the detailed facts as to the vegetative covering, climate, and soil in the four townships and a half surveyed. It is proposed to publish the general results of the survey particularly in Northfield Township in collaboration with the College of Agriculture. The details of the investigation together with the maps are to be published for distribution in the regions surveyed in the hope that the facts ascertained may prove to be of immediate practical application in the respective areas. While this is the first accurate and detailed survey work to be undertaken by any state, the Forest Service of the National Government has adopted and has been applying these methods to the study of forest and grazing areas of the National Forests. Here the work has proved so satisfactory that it is being rapidly extended to all of the National Forests.

Publications.—The publications of the Botanical Survey within the past two years have been *Minnesota Mushrooms*, 1910, Part II of Volume IV of *Minnesota Botanical Studies*, 1911, *Minnesota Trees and Shrubs*, 1912, and *Guide to Autumn Flowers*, 1912. During the past five years there have been distributed approximately 20,000 copies of bulletins and reports of the Survey. Somewhat more than half of these have been distributed in Minnesota, while the remainder have gone to exchanges in this country and abroad, and an increasing number have been purchased by non-residents. The present sale of reports approximates \$500 a year and could be materially increased if this seemed desirable. The mailing list of the Botanical Survey numbers about 1,000 entries, consisting of botanical institutions and teachers and investigators in botany and allied sciences. Of this number about 500 are distributed in the United States and an equal number are sent to 45 different foreign countries. The return in the way of publications and exchanges from these amounts to about 500 volumes and pamphlets each year. Of these about 50 are periodicals, exclusive of the experiment station reports received in exchange.

Recommendations.—For the coming biennium it is hoped to extend greatly the work of the classification survey in the belief that this method of taking a definite inventory of the plant possibilities is not only of the first importance in the regions not yet settled, but is also of great value in the long-established farming regions of the State. For such work, \$5,000 a year would not seem to be extravagant and it is proposed that this amount be provided in accordance with the terms of the agricultural survey proposed by the College of Agriculture. In addition an equal sum is needed to maintain the present work of publication and to care for the printing and distribution of the classification survey reports. This sum would also make it possible to continue the botanical investigations of the Survey which are not so immediately connected with the problems of agriculture and forestry, but are of fundamental nature and contribute sooner or later to these fields. Accordingly I wish to recommend that \$5,000 a year for the next biennium be provided for the work of the Survey and that in addition provision be made for the Survey to carry on in connection with the agricultural survey such work as is assigned to it as indicated above.

Respectfully submitted,

FREDERIC E. CLEMENTS, *State Botanist*

THE UNIVERSITY LIBRARY

To the President of the University:

SIR: I beg to submit for your consideration the following statement of facts regarding the University Library together with certain suggestions in reference to the policy to be pursued in its future development. In effect the statement will be a report of the Library for the period of six years, since August 1, 1906, during which time I have been Librarian.

The present collection of books.—The University Library contains today approximately 160,000 volumes. No exact statement of numbers can be made, as up until 1906 considerable numbers of books were purchased by departments without passing through the records in the General Library and in some cases without record being made in the department itself. It has been thought wise to defer the final count until the cataloguing of the various collections is complete and a higher degree of accuracy can be obtained than would be possible at the present. Aside from the books in the Library Building there are in other buildings the Agricultural library, with certain departmental collections, the Law library, the School of Mines library, and the Medical library (incorporating the departmental libraries of Pathology, Medicine, Anatomy, Physiology, and Pharmacology, and small collections of books at the Hospital and at the Dispensary). The Colleges of Chemistry, Dentistry, and Pharmacy have their own libraries and the College of Engineering, departmental libraries of Civil, Mechanical, and Electrical Engineering and Engineering Drawing. Connected with the College of Science, Literature, and the Arts there are in Pillsbury Hall the libraries of Botany, Zoology, and Geology; in the Physics Building the library of Physics; in Folwell Hall the departmental collections of Mathematics, Astronomy (part of this collection is in the Observatory), French, German, Scandinavian, Rhetoric, Latin, Greek, and Comparative Philology. There is also a small collection of books on the Fine Arts at that department. I shall speak of the problems connected with the administration of these collections later in the report.

Library catalogue.—When I took charge of the Library, the existing catalogue was a very incomplete and imperfect author list. After some study it was considered to be the part of wisdom to begin the work *de novo*, to catalogue completely all accessions and to recatalogue the books then in the Library as time and funds permitted. Work was actually begun on the new catalogue on October 1, 1907, and, aside from a record in dictionary form of all accessions since that time, the catalogue contains a complete statement of our resources in Philosophy, Education, Political and Social Science, American, English, Scandinavian, and Bohemian literatures,

Philology, Geography and Travel, Biography and History, and the collections in the School of Mines and a part of the Medical collection. There remains, therefore, to be included, of the books in the Library on October 1, 1907, those classed as Religion, Literature (other than that portion noted above), Science, Useful Arts, and Fine Arts, and all of the departmental collections referred to above except that part of the Medical collection already finished and that of the School of Mines. A statement of the work on the catalogue in statistical form follows:

	Titles Catalogued	Volumes Catalogued	Library Congress Cards	MSS Cards
1907-08.....	8242	20630	14124	14338
1908-09.....	7833	25782	13762	13457
1909-10.....	5841	14374	11335	10476
1910-11.....	7761	13326	24041	11253
1911-12.....	9927	19421	23716	17273

The Congressional and Harvard cards.—The Library is a depository of the Library of Congress Catalogue and from the beginning of the work it has been of the greatest possible service to us in cataloguing. We are able to purchase an increasing number of cards used in our own catalogue and they are, notwithstanding their greater fullness and legibility, about half the cost of similar cards made by our own staff. Against this saving of roughly 50 per cent must be charged a part, impossible to estimate accurately, of the cost of filing of the depository cards and of the cases in which they are contained. This cost is estimated, under conditions as nearly normal as possible, at \$1.47 per thousand cards, and at the rate of 52,000 cards, approximately the annual output, \$76.44 per year. The annual cost of the cases is \$120.00. This catalogue, increasing so rapidly as it does, makes a considerable demand on us for floor space. Another case must be added next summer and it will be impossible to place it in the cataloguing rooms where the remainder of the catalogue is installed. We have recently subscribed for the printed cards issued by the Harvard University Library and comprising such titles in their own catalogue as are not included in the Library of Congress Catalogue. These cards filed with those of the Library of Congress will add very greatly to the bibliographical usefulness of the complete collection. We should have also the cards issued by the John Crerar Library, but I have never yet felt that the funds at our command permitted their purchase.

Cataloguing needs.—We ought to be making more rapid progress in bringing up the arrears of our cataloguing. The departments whose collections are outside are impatient, and rightly so, because we do not undertake the cataloguing of their books, but we have never been able to secure the funds for the necessary increase in our staff. We should add to the cataloguing division next year, if possible, an assistant at a

salary of \$1,000 to revise the work of the staff, relieving the head cataloguer of this work, two cataloguers at \$780 each, and one unskilled assistant at \$600.

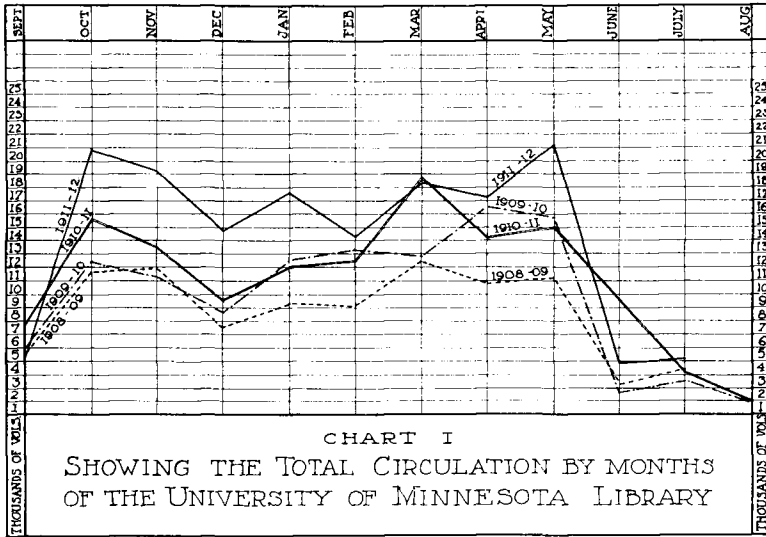
The Loan Department.—The efficiency of a library is judged by the majority of its users very largely, and quite properly, by the speed and accuracy with which they are served, the convenience with which they may consult the catalogue, and the quality of the reference service. The work of our loan desk is handicapped on almost every side and that the staff gives such good service as it does is very gratifying as it is almost the only palliation in a situation which admits of little improvement so long as we remain in the present building. Recent tests, conducted without the knowledge of the assistants on duty, show that the average time elapsing between the delivery of the slip and the receipt of the book is one minute and a half, the range being from fifteen seconds to fifteen minutes. It must be said, however, that this statement does not include the time during which the reader must sometimes wait after he has prepared his slip before he can hand it to the page. During the first fifteen minutes of every hour there is inevitably a congestion of readers about the loan desk and we do not have a staff of pages large enough to give them the rapid service that they should have. The wage which we pay is so small that we are generally obliged to start out the year with a force almost entirely new and it takes at least two months before they reach anything like efficiency. This same cause has a secondary result in that the books are not returned to the shelves as rapidly or with as much accuracy as they should be. A book misplaced is, for the time, a book lost and the attendants are obliged to spend a large amount of time in looking for books not found by the pages. The loss of time to the reader is considerable and of temper, enormous.

Stack Room.—The additional space, which is being provided during the current summer, will relieve for about two years the pressure on the stack room. It is difficult to see where any additional shelving can be erected at the end of that time.

Increase of circulation.—The rate at which the work done at the loan desk is increasing is best shown by the graphic statement submitted herewith (Chart I). The figures have no absolute value as indicating the total amount of reading done by the students, as a very large share of their work is with books on the open shelves or in the departmental libraries where no record is kept. The figures do show, however, that there has been a very positive and gratifying increase in the amount of reading done, the increase during the year being approximately 16 per cent over last year.

Serials.—The Department of Serials receives, records, cares for, and binds: 1. All periodicals received by purchase, exchange, or gift. 2. Publications of a serial nature issued by national, state, city, or foreign governments. 3. Reports and bulletins of societies, of corporations, and of organized bodies of every sort. 4. Publications of educational institutions. This we are attempting to accomplish with a staff comprising one well-trained, but poorly paid, head of the department, one

untrained assistant giving only part of her time to this work, and one page; and in a room less than half the size that it should be for the adequate handling of the material. The crowded condition begets inevitable confusion and the confusion makes the work even more difficult. Our present subscription list numbers 764 and the annual cost is about \$3,500. Our binding, which is in my judgment good, but not excellent in quality, costs about \$2,600. We should be spending about \$3,000 at least.



Need of a bindery.—Had we the space in our building for it, we should establish our own bindery. Such a plant is not expensive to equip and, while the actual cost of binding would probably be little, if any, less than we are now paying, the work would be done under our own eyes, we could be more sure of the material used, work needed at once could be more easily hurried, and there would be less liability of loss by fire.

Order department.—This is, I believe, in excellent hands and is doing good work. Two salaried assistants should, however, be provided to relieve the head of the department of a large amount of purely clerical work and to permit her to render larger services of a bibliographical nature to the various university departments.

The Reading Room.—Under the charge of Miss Firkins, Reference Librarian, the reading room is very efficiently administered, but it is an unsatisfactory room in almost every particular. It contains 143 desks supplemented by 15 table seats, whereas it should be twice as large. The light is poor so that on a moderately dark day artificial light must be used; the ventilation is entirely inadequate; the space for the catalogue and for the loan desk—which never should be in the reading room at all—is cramped and inconvenient.

Protection against fire.—At your suggestion, I requested our Department of Electrical Engineering to make a careful inspection of the wiring of the Library and to determine as to its safety. They reported early in the fall that the new wiring in the Periodical Room was safe but that the wiring in the stack room should be replaced. They were good enough to furnish detailed plans for the installation of a new system. I immediately placed these plans in the hands of the Superintendent of Buildings who made an inspection on his own account and pronounced the installation adequate. Nothing has in consequence been done and whatever danger there was still remains. The greatest fire hazard which we are running is, however, in Pillsbury Hall. The collections of the departments of Animal Biology and Botany are the most complete of any on the Campus and it would be difficult, if not impossible, to replace them at any cost. The recent installation of the Winchell Library of Geology renders even more imperative the necessity of housing these collections in a fire-proof structure.

STATISTICS OF UNIVERSITY LIBRARIES, 1912

Institution	Volumes in Library	Volumes added 1911-12	Expended for books, etc. 1911-12	Appropriation 1912-13	Staff	Total salary account
Brown	215,000	14,060	\$25,581	\$20,743	13	\$12,850
Columbia	540,338	14,528	48,232	48,500	62	61,030
Cornell	409,700	14,491	19,878*	24,200	18	21,380
Harvard	916,275	40,642	30,422**			
Johns Hopkins	166,399	9,219	18,500	14,000	14	10,879
Leland Stanford Jr.	205,801	14,684	33,098	40,375	25	25,440
Ohio State	117,000	10,300	20,000	20,000	16	14,100
Princeton	294,915	12,067	14,838	22,500	32	21,500
California	238,506*	26,161	33,800	24,000	25	30,630
Chicago	381,351	27,689	37,593	37,593	48	43,216
Illinois	212,720	29,158	56,533	32,000	40	39,000
Indiana	86,521	4,919	9,900	9,900	6	7,000
Iowa	108,947	8,239	17,700	17,500	11	9,280
Kansas	81,214	5,000	14,000	10,000	13	8,630
Michigan	305,684	17,591	30,000	30,000	20	25,980
Minnesota	160,000	15,000	32,389	36,964	24	24,245
Missouri	110,816	7,738	15,000	15,000	12	10,070
Nebraska	100,000	6,175	17,000	17,000	12	10,350
North Dakota	44,390	3,859	4,028	4,800	5	4,430
Pennsylvania State	352,674	15,738	12,650		27	
South Dakota	19,000	1,700	4,000	4,000	2	2,250
Washington	50,163	5,857	13,273	5,000	6	8,640
Wisconsin	192,513**	10,800	24,425	29,200	18	22,650
Yale	900,000	45,933	32,542		50	36,834

* Not including Bancroft collection or collections outside of Berkeley.

** Figures for 1910-11.

*** Not including State Historical Library of 175,000 volumes in same building.

Departmental Libraries.—The most perplexing problem in the administration of a university library is the scope and function of the departmental collections, and it is safe to say that a solution satisfactory to all concerned is scarcely possible. Individual interests must, it seems to me, give way to the common good as far as this can be done without reducing efficiency. No university is rich enough to provide a library in every department which shall contain all the books which the men in the department use or should use. Physics runs into chemistry and

chemistry into physiology, geology and mining cover much the same field, medicine and engineering make requisition on almost the whole domain of science and art. Sometime ago a new professor submitted to me a list of about two hundred books which he wished to use in a course which he proposed to offer for the first time at this University. One hundred twenty-six were already in the library, but of these fifty-two or over forty per cent were in libraries of departments other than that in which the man was primarily working. Again and again men make the statement that a given book is used only by them or by their department when we know that actually the book is needed perhaps in half a dozen different fields. A certain amount of duplication is necessary and unavoidable but it has its limits, for every duplicate purchased renders impossible the acquisition of some other book. Inertia has a tendency to make the department having a departmental library limit its work to that collection and to neglect the resources available elsewhere.

From an administrative standpoint, the question is more difficult still. It is impossible to provide a trained attendant for each of these collections. As a rule the department assigns its care to some one of its members but the larger interest is almost sure to crowd out the smaller and the supervision is nominal. The hours during which the collection is available for use by the students are relatively few and the temptation to borrow books with or without record is great. As a result the losses from these collections are large. Students, and to a certain extent members of the Faculty, feel a considerable hesitation about using a departmental library other than that with which they are definitely associated. Even within the department it is sometimes true that a considerable part of the collection is transferred to the office of the head professor and the books are unavailable for use by other members of the teaching force of the department, much less those outside. We find it to be true frequently that the books are so scattered that the members of the department themselves do not know that certain books are included in the collection.

A recommended program.—In my judgment our program should be something as follows:

1. College of Science, Literature, and the Arts.—Plans should be made to incorporate in the new library building all of the departmental collections in Folwell Hall, to unite the libraries of Botany and Zoology, to merge the library of Geology in that of the School of Mines, to preserve the integrity of the libraries of Physics and Chemistry, and to transfer to the main collection material of use to more than one department.

2. College of Engineering.—The libraries of the different departments should be united in a single collection with the provision for a rigidly limited number of laboratory manuals in the various departments.

3. College of Medicine.—There is no question, I believe, that the consolidation of the medical collections should be accomplished. Sentiment in favor of such a move is very rapidly growing but the fact that

the departmental libraries of medicine and surgery are the gifts of the professors make it unwise to press the centralization against their wishes.

4. College of Law.—The collection should be kept intact and under skilled direction but it should be limited to private law, the collection on constitutional and international law being kept in the main library.

5. College of Dentistry.—This collection should be housed, as it now is, with the medical library and the small laboratory library continued at the College.

6. College of Pharmacy.—The work of this College, touching as it seems to do, so many fields, may require the continuance of a special library but I have not been able to make a study in sufficient detail to make a recommendation.

7. College of Agriculture.—The present situation seems to be satisfactory.

An exchange division.—This should be established in the Library and from it should be distributed all university publications except the regular distribution of bulletins from the office of the Registrar and from the Experiment Station. Our exchange list is now bringing us a considerable amount of material of great value but the field has never been canvassed systematically and the distribution is irregular. At the termination of the work of the Geological and Natural History Survey, the Library was made agent for the distribution of the reports but the more recent issues of the departments of Botany and Zoology have never been turned over to us although the departments are very courteous in honoring our requisitions for copies of these publications to be used as exchanges. An arrangement was effected two years ago with the State Bureau of Labor whereby foreign bureaus of labor and statistics, in exchange for the reports of the Minnesota Bureau, send their publications direct to us. The projected establishment of a University monograph series and the publication of our doctor's dissertations, the re-establishment of the Geological Survey, and the creation of the Mining Experiment Station will enlarge the field of our publications and the potentiality of their use as exchange matter. This work can be begun and carried on, I believe, by an extra stenographer attached to the office of the Librarian. The expense is slight in comparison with the advantages to be obtained.

Staff and salaries.—The staff of the Library as at present constituted is, I believe, a very satisfactory one judged by present standards of university library administration. In my opinion, however, the university libraries of the country will not attain to their maximum usefulness until they are recognized as in Germany as autonomous divisions of the university and until in grade and pay the higher positions are the equal of those of the teaching staff. I believe that we have already arrived at a time when the heads of the various departments should be paid a normal salary of \$1,500, that our standard cataloguing salary should be raised from \$780 to \$900, and that an intermediate grade should be established in certain departments at a salary ranging from \$1,000 to \$1,200. The assistants in charge of the various college libraries should receive

from \$1,000 to \$1,500. The Reference Librarian should be advanced at once to \$1,500, the heads of the Loan and Serial Departments from \$900 and \$780 respectively to \$1,200, placing them on the same footing as the heads of the Cataloguing and Order Departments. It is but simple justice that this action be taken. Our present salary of \$780 paid to cataloguers is so small that we can not expect competent assistants to remain with us and they are constantly leaving us for better positions. None of the present staff has been in the service of the library for more than two years.

Need of a library building.—The time has come, I believe, when we should make an earnest and concerted effort to secure a new Library Building. If such a building should be granted by the next Legislature, it would hardly be possible to occupy it before the summer of 1915 or 1916 and it is difficult to see how we can remain in this building longer than that and give anything like decent service to the University. I wish to urge as strongly as possible that an application be made to the Legislature of 1913 for an appropriation of not less than \$500,000 to be used in erecting such a portion of a building as will house the Library for at least fifteen years. This building is needed because, judged by the standard of adaptation to purpose, our present building is a monumental example of what ought not to be. Its defects are: Insufficient stack room; insufficient storage room; insufficient seminar and study room; crowded reading room; crowded periodical and document rooms; crowded cataloguing quarters; poor ventilation; bad light.

The immediate result of insufficient stack room is the shelving of books in illogical places, which makes for inconvenience and sometimes failure to find a given authority. It makes necessary the frequent shifting of whole sections of books, which in turn consumes the time of the pages which is needed for other service.

Large storage capacity is needed for the care of catalogues, reports, and duplicate collections.

We need to develop the seminar system and to make the seminar rooms a part of the Library. We need to provide space for collections upon special subjects and for rare books. We need desk space in or near the stack room where advanced students, members of the Faculty, or visitors doing special work may be given every help in their researches.

Crowded reading room.—The present room is overcrowded daily. It is an injustice to assign to students required reading and not to provide them with proper facilities for doing that reading. The present reading room is noisy and uncomfortable to the last degree. The loan desk should not be in the reading room. The disturbance consequent upon the application for books and the distribution of them penetrates to the further end of the room. We have not space for the convenient use of the card catalogue.

In the periodical room there is space neither for the proper care of the collection nor for the readers.

Space for the cataloguing force is inadequate. To carry on the

regular work and to provide for the proper administration of the department libraries is difficult, if not impossible, under existing conditions.

Hygienic conditions are not the least of our present troubles. The ventilation in the reading room is so inadequate that it is not an appreciable quantity. During many months of the year artificial light is used almost continuously in the reading room. The health of students and attendants is menaced by these conditions.

Leaving out of consideration these specific drawbacks to efficient administration in the library, there is a waste of time, energy, and patience consequent upon these inconveniences that is detrimental to the interests of the University. In a college library quick service is one of the chief factors in efficiency, and it can not reach the desired maximum without space and convenient arrangements. Correlated departments should be near each other. The reference desk and the bibliographical room are now separated by the length of three offices, and the loan desk and the catalogue by one office and two doors. The aggregate waste of time from lack of conveniences, trifling in themselves, is a source of injustice and annoyance to all users of the library.

There remains to be mentioned one important point—centralization. A university library should be a great arterial system of which the general library is the heart or nucleus and from which branch the circulating system of the departmental collections. The campus libraries should form an organic whole, all drawing from the central source and from each other when necessary. To develop and administer such a system with prompt service and without friction requires an equipment far beyond our present possibilities.

The general library, handicapped by no departmental prejudices, keeps steadily before itself the altruistic and utilitarian ideal of the greatest good to the greatest number. The highest development of no department can be attained until it draws constantly and easily from a vast collection of properly selected and efficiently administered books in the general library. Our greatest possible usefulness can not be attained under present conditions.

The above statement might be supplemented by the enumeration of various services which the Library should perform but which are impossible in our present quarters, but I prefer to reserve such details until later. If it can be determined that an active campaign for a building may be permitted, I shall wish to submit a report somewhat in detail in regard to the planning of that building. A specific study of the problem should be begun at once so that when the Legislature meets we can present the matter in more detail and in more definite form than has been possible in former requests for buildings.

Respectfully submitted,

J. T. GEROULD, *Librarian*

THE FRATERNITIES

To the President of the University:

SIR: As retiring president of the Interfraternity Council, of the University of Minnesota, I wish to present a general report on fraternity conditions as I see them to-day.

General relations.—In my judgment there has, during the last two or three years, been a slow, but consistent improvement in the general fraternity relations. I believe that to-day there is a much more tolerant and friendly spirit existing among the various chapters than there has been in the past, and if nothing unforeseen occurs I believe this goodwill will continue to grow. There has been an increasing recognition of the proper relation existing between the University and the Greek letter fraternities. To-day it is not anywhere near so well developed as it should be, but I am encouraged by what I believe is a steady growth in the recognition of this relationship.

Standard of scholarship.—In the matter of scholarship, for the last two years I have made it a point to prepare complete reports on the individual men of every fraternity, these reports being distributed only to members of that chapter and their alumni. In addition to these confidential reports, I have made up a comparative statement, showing the relative standing of the fraternities. These have been generally distributed. These reports have aroused the interest, not only of the alumni, but of the undergraduate men as has been evidenced by protests and lengthy arguments as to the justice of this statement and that statement. Three chapters that two years ago ranked below eleventh place, a year ago had come up to second, third, and fourth place. I am continually receiving inquiries from alumni of the Twin Cities and national officers of the fraternities asking for these reports and for special reports as to the condition of their chapter and the character of the men.

Moral standards.—Morally, it is my best judgment that there has been a strong improvement within the last few years. I do not believe that there is a single undergraduate Greek letter chapter on the campus that will tolerate loose conditions about its house. This was not true within very recent years. I do not believe that the drinking situation is a serious problem at present. With respect to sexual vice there has been great improvement.

Notwithstanding the optimism of this report, I feel that so far only a very small beginning has been made, and that there remains a tremendous work to be done and good to be accomplished. This, I believe, can

THE GENERAL ALUMNI ASSOCIATION

To the President of the University:

SIR: I have the honor to present a statement concerning the General Alumni Association for the year 1911-12.

Organization and object.—This Association is an organization of alumni and former students of the University of Minnesota; members and former members of the Faculty and Regents are entitled to become honorary members. Its object is to unite the alumni in the service of the University—business rather than social. The management of the affairs of the Association is vested in a Board of Directors, consisting of two directors chosen by each college alumni association. The Board of Directors is, at present, made up as follows: College of Science, Literature, and the Arts, Fred B. Snyder, '81, Gratia A. Countryman, '89. College of Engineering and the Mechanic Arts, Wm. I. Gray, '92, James B. Gilman, '94. The Department of Agriculture, D. A. Gaumnitz, '04, John A. Hummel, '99. The College of Law, Hugh V. Mercer, '94, Kay Todd, '00. The College of Medicine and Surgery, Soren P. Rees, '97 (Acad. '95), Charles W. Bray, '95 (Acad. '91). The College of Homeopathic Medicine and Surgery, Asa J. Hammond, '96 (Acad. '91), Alfred E. Booth, '99. The College of Dentistry, Thomas B. Hartzell, '93 (Med. '97), Frank E. Moody, '96. The College of Pharmacy, Arthur G. Erkel, '02, Manley Haynes, '12. The College of Education, Conrad G. Selvig, '07, Paul C. Higbie, '07. The School of Chemistry, Frank W. Emmons, '99, Edward J. Gutsche, '04. School of Mines, M. S. Kingston, '04, A. Y. Peterson, '08. Ex-officio, Henry F. Nachtrieb, '82; E. Bird Johnson, '88; Charles F. Keyes, '96 (Law '99); Horace Lowry, '00. The officers of the Association are Henry F. Nachtrieb, president; Horace Lowry, vice-president; Charles F. Keyes, treasurer; E. Bird Johnson, secretary.

Meetings and activities.—The Association has but one annual meeting; the date of this meeting is fixed at or near charter day, the 18th of February, each year. The Board of Directors meets on the first Tuesday of each month for the transaction of the Association's business. The Board of Directors represents the Association, and, in order to insure the greatest efficiency for every effort put forth, the Board has employed a secretary to give his whole time to the work. The Board directs its activities with two main objects in view: (1) keeping the alumni informed as to University affairs, through the *Weekly*, and, (2) keeping in touch with the alumni in order to be able to secure, when occasion arises, concerted action of the alumni, in behalf of the University. The Association is supported by funds derived from three main sources:

(1) The net income of the *Weekly*; (2) the income from the invested life membership payments; (3) the contribution of the University toward keeping up the alumni records. The records of the alumni are kept in the office of the General Alumni Association and every second year an alumni directory is issued by the Association. The University contributes, annually, \$1,500 to help meet a portion of this expense. The secretary of the Association is always available for any service the University may desire of him.

The Folwell tablet.—During the past biennial period the Association has placed in Folwell Hall a tablet in honor of Dr. Folwell, first president of the University; it planned and carried through the torchlight procession at the time of the inauguration of President Vincent; it has issued one alumni directory and has completed, ready to issue, another directory. Two annual meetings have been held and one picnic on the campus and a dinner at the Department of Agriculture.

The Alumni Weekly.—The Association has published the *Minnesota Alumni Weekly* during the past two years. This publication is now in its twelfth year and is recognized as ranking well with similar publications in other institutions. The *Weekly* has three thousand subscribers and is read by twice that many alumni and by members of their families. As soon as the Association can meet the expense, it is planned either to mail the *Weekly* to all the newspapers in the State or to issue a news letter containing the more important items of information of general interest to the people of the State.

Table of graduates.—Since the founding of the University and up to August 31, 1912, degrees have been conferred as follows:

The Graduate School.....	450	The College of Medicine and Surgery.....	1,029
The College of Science, Literature, and the Arts.....	3,624	The College of Homeopathic Medicine and Surgery.....	93
The College of Engineering and the Mechanic Arts.....	748	The College of Dentistry.....	656
The School of Chemistry.....	87	The College of Pharmacy.....	295
The School of Mines.....	205	The College of Education.....	133
The College of Agriculture.....	193	Graduates in Nursing.....	8
The Law School.....	2,133		
		Total degrees granted.....	9,654

Living alumni.—While it is impossible to give these figures with absolute exactness, the University has conferred degrees upon 6,907 men and 2,334 women. As nearly as can be determined there are 6,700 men and 2,230 women, living, who have received degrees from the University.

Until the new directory is out, it is impossible to give exact figures, but a close estimate indicates that of the 8,930 living graduates, all but 3,250 are residents of Minnesota. These 3,250 non-residents are scattered mainly through the northwestern states.

Respectfully submitted,

E. B. JOHNSON, *Secretary*

REPORT OF THE REGISTRAR

To the President of the University:

SIR: I submit herewith a report on the work of the Registrar's office.

Organization.—The work of the office falls naturally into five divisions: (1) Supervision, correspondence, and admission of students. (2) Registration and records, divided into four groups: (a) Science, Literature, and the Arts, and Education, (b) Colleges of Engineering, Mines, and Chemistry, (c) Colleges of Law, Medicine, Dentistry, and Pharmacy, and (d) Graduate School and Extension Division. (3) Fees, including (a) Statements, (b) Deposit charges, and (c) Refunds. (4) Monthly reports and statistics. (5) Editorial department.

The work of these divisions requires the time of the following officers: Registrar, secretary, four record clerks, one editor, one proofreader, one statistician, and one general assistant. Student help is employed as needed throughout the year. During registration periods from six to ten such extra clerks are necessary.

Duties.—Here as in many other universities and colleges, the functions of this office have never been clearly defined. A number of its now recognized duties were accidental services in earlier years. The duties which the office has been performing are briefly outlined as follows: (1) It passes upon the entrance credentials of all students. (2) Has charge of the registration of all students. (3) Keeps the records of students. (4) Indicates the amount of fees to be paid by each student. (5) Enforces regulations governing payment of same, and determines all refunds. (6) Certifies records for graduation in the Colleges of Science, Literature, and the Arts, Engineering, Mines, Chemistry, and Education. (7) Acts as secretary and reference bureau for all communications not addressed to specific persons. (8) Edits all catalogues, publications, and printed matter issued by the University, and determines stock, style, type, form, etc. for such material. (9) Compiles and edits such publications as (a) The Bulletin of General Information, (b) The University Address Book, (c) Information for New Students, (d) Faculty Rules and Regulations, (e) Official communications to high schools and other preparatory schools, and (f) Baccalaureate and Commencement programs, statistical tables, etc. (10) Has charge of the distribution of all bulletins, (11) Exercises disciplinary power in the enforcement of Faculty regulations as related to students, the Registrar being secretary of the Faculty of the College of Science, Literature, and the Arts, and clerk of the University Senate. (12) Is perforce a bureau of general information: (a) in an external way to the general public, (b) in an internal way to students and faculties.

Physical changes.—For the past eight years the office had been seriously handicapped because of its limited room. To relieve this in part during registration periods, a booth was constructed in the Library rotunda and this served as an office in itself for the needs of freshmen. The scheme, however, was not economical. The efficient and experienced office assistants could not be in both offices at once and just such service was needed at both places. In December, 1911, provision was made for remodeling the rooms adjoining the office, thereby allowing it to expand into two new offices, nearly doubling the original floor space. The old office was rearranged and windows were cut through the wall into the outer hall, making it possible for students to have their wants attended to as in a bank, without entering the office. These changes also made possible a private office for the Registrar and separate offices for the editorial division and mail department. When all the changes authorized have been made, the office will present a business-like appearance and be able to render a far more efficient service than in former years.

Modifications in junctions.—During the past year it has been deemed advisable in the interests of greater efficiency for the office to undertake new duties; among these are: (1) the calling for monthly reports on delinquent students from all instructors, warning such students, compiling lists of these for the respective deans and student work committees.

(2) Student deposit accounts.—Instead of the special assessment of penalties for late registration, change in registration, condition examinations, and the numerous petty charges made each time a student secures a locker, post-office box, military equipment, etc., it was deemed advisable to require each student to deposit five dollars at the opening of the year and deduct from this amount the miscellaneous charges mentioned, as they might occur. This plan has been in effect for one year and has proved entirely satisfactory. This office has full charge of the details connected with this work and, in addition, the responsibility of the assignment of all lockers in Folwell Hall and the Library Building.

(3) The organization of an editorial division.—Heretofore this office has handled only the bulletins of the respective colleges. Now all orders for printing, with copy, are submitted to our editorial division, the purpose being to standardize all printing and ensure dignity and uniformity in stock, type, and press work.

(4) The appointment of the Registrar as clerk of the University Senate.

The establishment of a bureau of general information in the post-office with the Postmaster in charge has relieved this office of the responsibility of maintaining a lost and found department and bureau of publicity pertaining to things on the campus. The posting of all bulletins is now under the supervision of that department.

Recommendations: (1) *Entrance examinations.*—The entrance regulations provide that under certain conditions entrance examinations may be offered. In offering these examinations it is necessary that the persons preparing them be in very close touch with the work of the preparatory schools; otherwise the examination may be no test on the work

covered. University instructors have not at all times proved equal to the task. There are four different units in English offered for admission. A student taking an examination in the second year of high-school English has a right to expect that the questions will not be foreign to that period of study. Students have alleged that such inconsistent examinations have been offered.

Some one person should be authorized to provide *all* the examinations offered by the University. This officer should prepare the examinations with the advice and approval of the High School Board examiner in order that the standard be proper and the field definite.

Where students are required to take examinations in certain subjects for admission neither the examiner nor the readers of papers should know which college the student expects to enter, and *no supplementary examinations* should be allowed.

The whole question of entrance examinations should receive immediate and careful attention.

(2) *Freshman registration.* The regulations governing registration are made by the Registrar, but are restricted by the Faculty rules of the individual colleges. The freshman registration process is too complicated at the present time. The procedure for the College of Science, Literature, and the Arts as given below is quoted verbatim from "Information for New Students."

1. Call at the Information Window, and secure matriculation card, address card, and registration blank and fill out carefully in ink as indicated. (Women secure in addition a census card for the Dean of Women.)
2. Present registration blank at Window No. 1 for approval of selection of subjects.
3. Present approved registration blank to Assignment Committee, Room 206, Library Building, second floor, for assignment to class sections.
4. Return matriculation card, registration blank, class cards, address card, and physical examination certificate to Window No. 2.
5. Secure statement of fees at window marked "Statements" and pay the Cashier the amount indicated.

At some point before the student reaches direction four he must secure a certificate of appointment for a physical examination.

By the time the student gets through the process he is bewildered and fatigued. He feels as though he had been buffeted about "from pillar to post." During the congested week of registration officials have little time to spare in explaining away these difficulties. The process should be so simple that a student could complete it entirely without leaving his home town. It can be done if (1) the physical examination appointment can be deferred until after registration, and (2) the assignment work can be done *in absentia*. The advantages to be gained by such an arrangement warrant its receiving careful consideration.

Marking system.—At the present time there are four distinct marking systems used in reporting students' grades to this office; last year there were five. When a student in a given college takes work in other colleges his record is an enigma to all except those closely familiar with all the marking systems. There should be one and only one marking system

within the University, in so far as official reports to the Registrar are concerned.

Transfer of students within the University.—An old regulation of the general faculty prescribed that a student transferring from one college to another should make up all deficiencies in the sending college before securing a degree in the receiving college. Since the number of colleges has grown, the regulation has fallen into abeyance until now there is no uniform practice. There should be a uniform regulation for all colleges within the University. Experience has shown that a student may fail miserably in certain departments of a given college and after transferring make an excellent record. To require such a student to make up deficiencies in the sending college is apparently unjust. The following regulation is suggested: The dean or authorized committee of the receiving college shall say whether the applicant for transfer is to be admitted or not. After the student is admitted, he shall be held only to the requirements applying to other students in that college.

Advanced standing.—Advanced standing has thus far been an individual college matter left to the appropriate committee of the college concerned. The results from the administrative point of view have been decidedly unsatisfactory, due largely to the fact that no scientific working basis has been established and that the committees are never in session during the summer vacation when most of the inquiries come. The Registrar has handled such of these as are covered by precedent, others have been forwarded to chairmen of committees. Very often the chairman would be out of the city, mail would be forwarded, sometimes mislaid or lost, and the ultimate results far from gratifying. It has often taken more than a month for an applicant to get a verdict on his case.

The entire question of advanced standing routine should be considered very carefully and thoroughly. One person should give his entire time to that work, put it upon a specific basis, and act as examiner for the University as a whole.

Boarding and rooming list.—The University prepares a list of boarding and rooming places for students of the Summer Session. The Y. M. C. A. prepares a card catalogue of such places for the regular college year. Students may consult this catalogue at the Association Building. The University should prepare a complete list of places in southeast Minneapolis for free distribution to inquiring students. Such a list need not contain more than the name, address, and schedule of prices. Details as to furnishings, accommodations, etc. could still be furnished by the Y. M. C. A.

Salaries.—The task of adjusting registration and record-keeping regulations to a varying curriculum is a highly specialized work. To see that students comply with faculty regulations in meeting the shifting requirements for a degree in a given college calls for ability far superior to that of the routine clerk. It is exceedingly desirable that those members of the staff in charge of registration and records be University graduates, and it is necessary too that such assistants be encouraged to retain

FINANCIAL REPORT

To the President of the University:

SIR: I have the honor to submit herewith my report as Comptroller of the University of Minnesota covering its financial operations for the fiscal year ending July 31, 1912. The year has been a constructive period, as a complete re-organization of the system has been instituted and the budget system adopted.

THE ORGANIZATION

	Chief Clerk and Acting Purchasing Agent	Assistant Price Clerk Order Clerk Invoice Clerk	
			Cashiers Bookkeeper Budget Clerk Rent Collector
	Auditor	Accountant File Clerk Pay-roll Clerk Stenographers Statistician Inventory Clerk	
Comptroller	Superintendent of Buildings and Grounds	Assistant Telephone Operators Engineers Mechanics Electricians Plumbers Carpenters Tinnern Painters Campus Men	Stenographer Bookkeepers Storekeeper Janitors Watchmen Teamster

The Budget System.—The fiscal year ending July 31, 1912, marks the beginning of the University under the "budget system" and the result has been most gratifying to the State Officials, the Administration, and the Faculty. The funds of the University are derived from tuition and other fees, interest on investments, appropriations by the Federal Government, collections from the 23-100 mill tax levy, and direct appropriations. In preparing the budget the funds are carefully estimated and, after retaining a safe reserve, are apportioned to departments. Each college is given a section in the budget and each division of the college detailed as to pay-roll; each name or position given a pay-roll item number and each appropriation for supplies given a budget number. Should a department have appropriations from two or more funds, each is given a separate budget number.

SAMPLE PAGE OF BUDGET
SECTION C. SCHOOL OF BLANK

Name or Item	Office	Total	Chargeable to		
			Support	Specials	
				12	14
ADMINISTRATION					
1. Peter Smith	Dean and Professor Office Assistant	\$4,000	\$1,750	\$2,250	
2. Mary Jones		840	840		
Total Administration		\$4,840	\$2,590	\$2,250	
INSTRUCTION					
	See Admin.				
3. Peter Smith	Professor	\$3,500	\$1,250	\$2,250	
4. John Doe	Professor	2,200	800	1,400	
5. Carl Doe	Professor	2,200	800	1,400	
6. Edward Doe	Professor	2,200	800	1,400	
7. William Doe	Professor	2,200	1,100		\$1,100
8. John Brown	Asst. Prof.	2,200	1,200		1,000
9. E. L. Brown	Asst. Prof.	1,700	900	800	
10. Paul Jones	Instructor	1,200	1,200		
11. W. R. Jones	Instructor	1,200	1,200		
12. Charles Long	Com. Asst.	1,000			1,000
13. R. L. White	Dom. Asst.	1,800			1,800
14. G. M. White	Mechanic	1,080	1,080		
15. James Green	Helper	800	800		
16. Charles Green	Helper	720	720		
Total Pay-roll		\$28,840	\$14,440	\$9,500	\$4,900
1. Supplies		6,000	6,000		
2. Supplies		5,100			5,100
Total Section C		\$39,940	\$20,440	\$9,500	\$10,000

12. Support

14. Experiment

Pay-Rolls and Record.—The pay-roll record is ostensibly a copy of the pay-roll budgets of the several departments and in addition shows the monthly allowance and has columns for entering the rolls of the twelve months. Pay-rolls are made from the pay-roll record after such changes in the personnel, etc., as are necessary, are reported by the college

deans. One original and three carbon copies are made, two of which are signed by the individuals. The original signed pay-roll is included in an abstract to the State Auditor, who draws warrants on the several funds as indicated by a summary of the abstract and forwards to the State Treasurer who draws individual checks from the pay-roll copy sent him. Entries are made in the pay-roll record from the duplicate signed copy of the pay-roll which is retained in the Business Office. The fourth copy is retained in the departments until near the close of the month, when such changes as are necessary for the succeeding month are indicated and forwarded to the Business Office. Quarterly abstracts of the pay-roll record, showing total appropriation, amount authorized to pay for the time elapsed, and amount actually paid, are made and submitted to the President and Board of Regents.

The Supply Budget Ledger.—A record account is kept with each supply budget. The ledger provides debit and credit columns and columns for entering department number, budget committee number of each requisition, also estimated cost, actual cost, and reference. At the head of each page is stamped the fund from which the appropriation is made. The appropriations are credited in the budget ledger in numerical order. Until invoices giving the actual cost are received, the accumulated footings of the estimates are carried into the debit column in pencil and whenever the budget ledger is balanced the sum of the requisitions on which the actual cost is known is carried into the debit column in red ink, and the sum of the requisitions still in estimate form are carried into the debit column in pencil. The first red ink debit

SAMPLE PAGE OF SUPPLY LEDGER

DIVISION OF BUDGET No. 275

Dept	Req. No.	Date	REQUISITIONS			EXPENDITURES		
			Ref.	Est. Cost	Actual Cost	Ref.	Debit	Credit
483	1580	Sept. 15	2*	38.00	34.13	1	158.82	1,330.00
543	1730	Sept. 19	1	20.07	23.67	2	67.47	1,171.18
542	1766	Sept. 19	1	27.50	31.29			1,103.71
629	1944	Sept. 26	3	15.50	22.12			144.00
735	2414	Oct. 10	4	23.75	16.48	3	29.60	1,247.71
776	2569	Oct. 17	1	21.19	19.38	4	160.26	1,218.11
1037	3497	Nov. 17		101.77				1,057.85
1036	3503	Nov. 17	2	19.00	19.09		277.27	780.58
1153	4009	Dec. 7	4	18.60	21.75			
1296	4462	Dec. 26	1	84.48	84.48			
		1912						
1350	4704	Jan. 8		50.00				
1423	5097	Jan. 17	3	7.48	7.48			
1816	6450	Mar. 20		75.00				
2112	7566	Apr. 26	2	12.30	12.30			
2289	8245	May 21	2	1.95	1.95			
2342	8446	May 29	4	122.03	122.03			
2380	8454	May 31		14.95				
2419	8607	June 7		30.72				
2625	9236	July 5		4.83				
				**277.27	416.15			

*Bold face figures represent figures in red ink.

**Italic figures represent figures in pencil.

would be reference "1" and the requisitions making up the total would each be marked reference "1"; second red ink debit would be marked "2" and the requisitions making up the charge would each be marked "2," etc. Abstracts showing the condition of the budget ledger are made quarterly or oftener and submitted to the President and Board of Regents.

Requisitions.—Departments are requested to make requisitions for supplies sufficiently in advance of requirement to enable a careful scrutiny of all items and give ample time to secure competitive bids. Each sheet is considered a separate requisition, gives the department's serial number and the budget number to which the same is to be charged. Items on each sheet are numbered from one up and the estimated cost of each given. Four copies are typewritten, one retained in the department, three signed by the head of the department, sent to the Dean for approval, one remaining in the office of the Dean, two endorsed by the Dean and sent to the budget clerk in the Business Office to be given a budget committee number, entered in the budget ledger, and the available budget balance entered on the requisition.

Approval of requisitions.—From the budget clerk the requisitions are sent to the Budget Committee (President and Comptroller). Should the supplies be ordinary, the Committee approves for immediate purchase; any extraordinary items are held awaiting action of the Board. All requisitions, together with abstracts of the same, are presented to the Board of Regents with notations calling attention to such items as have not been approved by the Committee.

Purchasing.—No purchase is made except on a requisition which bears evidence of having been charged in the budget ledger and then only through the purchasing department, except small cash purchases for which contingent funds are provided. As far as practicable, written inquiries for prices, numbered consecutively, are mailed, as these invariably reach a more important personage in the firm. A mailing list classified by supplies, giving a list of the firms, is maintained, and an office copy of each inquiry, on which is noted the firms to whom sent, is filed in a special filing cabinet having compartments with removable labels numbered correspondingly. Quotations, when received, are arranged numerically and filed in the compartments. Each inquiry and compartment label gives date on which proposals are due. The proposals are tabulated and checked for order unless a question as to quality arises, or, upon request, they are submitted to departments for recommendation. It is frequently necessary to telephone for prices and, when consistent, at least three firms are called. A special form is used on which is noted the name of the clerk calling for prices, the name of the firm and representative giving same, and prices quoted. These are numbered in sequence with written inquiries and, when orders are placed, transferred to a contract file in numerical order.

Price record.—The judicious purchase of supplies requires careful study of specifications. The department is now compiling an index price record giving name of special material, followed by different speci-

fications should there be more than one grade. If requisitions do not specify grade, the same will be referred back to departments. The time thus consumed will be more than recompensed by furnishing the department with that which it desires and in saving correspondence in arranging for replacement. Quantities will also be entered with a view of ascertaining requirements and combining in annual contracts.

Orders.—The order system constitutes a very important and complete record in the Business Office, unfilled orders representing the entire outstanding obligations. Five copies of each order are made by using two double faced carbons and two tissue sheets. On each is given the requisition number, budget number, contract number, date delivery is due, department and place of delivery, and contract price of each item. The original goes to the party from whom the supplies are purchased, the duplicate to the unfilled file in the purchasing department, the triplicate to the department making the requisition, and the fourth and fifth copies are used as a tracer system, the fifth being retained in the purchasing department in a tickler file under the date material is due and the fourth sent to the department to be used as a receiving record and, as soon as the goods are received, returned to the purchasing department when the corresponding copy is removed from the tickler file. This enables the invoice clerk to determine whether or not the goods have been received. Orders remain in the unfilled order file until invoices covering the supplies are received; they are then sent to the budget clerk who enters the actual cost on the requisition and files the order in the closed order file.

Tracing.—The following is a sample of the tracer post card used by the invoice clerk in tracing shipments, invoices, etc.

<p style="text-align: right;">Minneapolis, Minn., 191</p> <p>Dear Sirs —</p> <p>Referring to our Order No. _____</p> <p><input type="checkbox"/> Have had no notice of shipment <small>Please advise this.</small></p> <p><input type="checkbox"/> Have received only part of the material. <small>Please advise this (date or balance).</small></p> <p><input type="checkbox"/> Material received, have no invoice. <small>Please send invoice.</small></p> <p><input type="checkbox"/> Invoices received but material has not arrived. <small>Please trace.</small></p> <p style="text-align: right;">The UNIVERSITY OF MINNESOTA</p>	<p style="text-align: center;">No. 2649</p> <p style="text-align: center;">POST CARD</p> <div style="border: 1px solid black; width: 40px; height: 30px; float: right; text-align: center; font-size: 8px;"> PLACE A ONE CENT STAMP HERE </div> <p style="text-align: right;">No. 2649</p> <p style="text-align: right;">..... 1912</p>
<p style="text-align: center;">POST CARD</p> <div style="border: 1px solid black; width: 40px; height: 30px; float: right; text-align: center; font-size: 8px;"> PLACE A ONE CENT STAMP HERE </div> <p style="text-align: center;">The UNIVERSITY OF MINNESOTA</p> <p style="text-align: center;">MINNEAPOLIS,</p> <p>Purchasing Agent MINN.</p>	<p>With reference to your Tracer No. 2649</p> <p style="text-align: right;">Report on this card re refers to Tracer No. _____</p>

The post card, return card, and stub all bear the same serial number. The stubs remain on file until the response is received from the firm, when it is removed. The remaining stubs represent unsatisfied tracers. If a repeat tracer is not responded to, the matter is taken up by correspondence.

Invoices.—Invoices in triplicate are requested and as soon as received are checked with the duplicate copy of the order. Each invoice is given a serial number; the original is recorded in a register and filed numerically, the duplicate and triplicate are sent to the departments for approval, the department retaining the triplicate and returning the duplicate. Invoices are followed from the date received until paid. The register gives the date sent to the department and date returned. They are also entered in a card index record, arranged alphabetically by firms. When the invoices are paid, the voucher number is entered on the card.

Vouchers.—Statements in triplicate itemizing approved invoices by dates and amounts are sent to firms or individuals for certification as to the correctness of the account and receipting. Two copies are returned. These together with invoices in duplicate are included in voucher envelopes, the original sent to the State Auditor's office and the duplicate entered in a classification record under date, number, date included in an abstract to the State Auditor and amount, and classified as to commodity, department, whether current budget or previous, as to funds, etc., and filed in numerical order in the Business Office.

Abstracts.—Abstracts of vouchers are made in triplicate; one copy accompanies the vouchers to the office of the State Auditor who draws warrants on the several funds and forwards to the State Treasurer. The duplicate is sent to the State Treasurer who draws checks in favor of the firms or individuals.

Collections.—*Fees:* Each student, when paying fees, presents a statement issued by the Registrar, indicating semester, college, and details of fees. The Cashier issues a receipt in triplicate for the amount paid giving reference to the Registrar's statement number. The triplicate copy is immediately forwarded to the Registrar's office. The receipts are entered in a receipt register, having columns for each college. Footings are carried forward to the end of the month, when they are posted in the ledger. Refundments are also entered in a place provided in the same register, and the footings at the close of the month posted in the ledger. The trial balance at the close of each month shows the total net fees as a debit balance, and the credit items the total collected for each college.

Miscellaneous receipts: Receipts in duplicate are issued for all moneys (other than fees) collected. These are entered in a register with columns for classification and the monthly footings posted in the ledger. The trial balance shows the total receipts collected as a debit, and the credit items show the total collected for each class. All moneys received are deposited in a bank, designated by the State Treasurer, to the credit of "The University of Minnesota State Treasury Account" and checks drawn in favor of the State Treasurer only will be honored. At the close

of each month a report of collections, together with the check covering, is sent to the State Treasurer. Copies of this report are sent also to the State Auditor and Public Examiner.

Filing.—Special effort has been made to establish a complete and carefully indexed filing system. With the exception of vouchers (the card index accounts with firms affording an index), one general card index, crossed by commodity or subject and firm or individual, is maintained for filing of all papers. Correspondence with reference to quotations is filed with contracts; with reference to orders is filed under order number; and the numeric system used for all miscellaneous correspondence.

Inventory.—Attention is called to the Abstract of Inventory (Table III) which is in accordance with the outline adopted by the Committee, Deans Woods, Frankforter, Shenhon, and the President and Comptroller. The instructions accompanying the outline have resulted in numerous changes in valuations which render comparison with inventories of previous years impractical. The Inventory Clerk is engaged in listing equipment on cards which will be arranged alphabetically; items will be listed separately by departments and, when completed, the system will be of value in the Business Office in checking requisitions.

Campus rents.—There are at present on the new campus fifty-eight houses which bring in an average monthly rental of approximately \$20.00 per month. This low figure is the result of the proximity to building operations. The law appropriates the rents to the improvement and care of the campus. Many of the houses, however, are in a run-down condition and, after necessary repairs are made, there will be but a small margin for campus improvement. The following is a table of collections for the present year:

Uncollected August 1, 1911.....	\$ 1,149.00	
Current rent August 1, 1911 to July 31, 1912.....	12,050.53	
		\$13,199.53
Rents collected during year.....	\$12,108.03	
Due and unpaid August 1, 1912.....	1,091.50	
		\$13,199.53

Item 98 of Table XXII, Statement of Funds, shows receipts \$14,622.61, the difference is the amount of rents collected by former treasurer, J. D. Bren, during previous years and credited to this fund in February, 1912.

Bookkeeping.—The budget for 1911-12 was based on the May trial balance together with appropriations and an estimate of receipts. The balances as they appear in the general books have been reconciled with the State Auditor's accounts. It developed, however, when the budget was being prepared, that the accounts of the Agricultural School and Sub-Stations had not been reconciled with the books of the Business Office for several years. The balances of August 1, 1911, have been corrected and the entries for the fiscal year will be reconciled. In comparing our balances with the State Auditor's books the contingent funds must be taken into account, the State Auditor having charged the amount ad-

vanced to the proper funds, whereas the Business Office charged "Contingent Fund" and credited the State of Minnesota. With the beginning of the last fiscal year the Agricultural Dining Hall, Sanford Hall, Shevlin Hall, and Elliot Hospital were included in the budget system. The magnitude of the business of these departments, together with the work of re-organizing the system, has resulted in considerable confusion and the system is not yet working satisfactorily.

I should earnestly recommend the adoption of the Board of Control system of estimating for Dining Halls, and that authority be given to appoint a steward whose duties it should be to spend a portion of his time at each of the dining halls assisting in preparing quarterly estimates and arranging for stock records.

A general storehouse for carrying in stock standard glassware, chemicals, stationery, hardware, fittings, etc., should be established as soon as possible and all supplies received at the storehouse for unpacking and delivering to departments. Requisitions from departments should be sent to the storehouse and such items as can be furnished, be filled from stock, the balance to be included in a general storekeeper's requisition on the purchasing department. Departments should carefully inspect stocks, and all supplies not being used should be returned to the storehouse. There is no doubt but that many requisitions could be filled from stock thus reclaimed. All the scientific departments have mechanical shops, and requisitions for nails, screws, bolts, etc., in less than standard packages and for other materials in small quantities result in the payment of much higher prices for these articles than if they were ordered in large quantities. With the establishment of a trolley system between the University and the Agricultural Department one storehouse could supply the entire University.

Dining Halls and Dormitories.—With the inclusion of the Dining Halls under the budget system, it was considered advisable to credit all moneys to, and make all payments from, the University Support Fund, as there was no other available fund for operation.

There was credited to the Support Fund from the receipts of the Agricultural Dining Hall during the year..... \$60,529.49
Expenditures..... 58,528.71

Leaving a credit balance of..... \$2,000.78
The receipts from Shevlin Hall credited to the Support Fund.. \$11,695.06
Expenditures..... 11,593.60

Leaving a credit balance of..... \$101.46
The receipts from Sanford Hall credited to the Support Fund.. \$27,637.12
Expenditures..... 13,495.95

Leaving a credit balance of..... \$14,141.17
This does not, however, show the true balance in the case of Sanford Hall, as from June, 1911, until the payment of fees in September, the expenses of the hall were paid from the University Support Fund, and

no charge was made for heat, light, janitor service, etc. With the beginning of the new year it is proposed to open separate accounts on the University books for each dining hall as per items 14, 15, and 16, Table XIX.

CONTINGENT FUNDS

University Contingent.....	{	\$11,750.00 from University Support Fund.
		2,000.00 from Heating Plant Fund.
Elliot Hospital.....		250.00 from University Support Fund.
Farm Contingent.....	{	4,800.00 from University Support Fund.
		200.00 from Dairy Extension Fund.
Forestry.....		200.00 from Forestry Support Fund.
Fruit Farm.....		100.00 from Fruit Farm Investment Fund.
Crookston.....		500.00 from Crookston Support Fund.
Grand Rapids.....		300.00 from Grand Rapids Support Fund.
Morris.....		500.00 from Morris Support Fund.

Contingent funds are advanced by the State Auditor for making emergency payments such as freight, gas, water, traveling expenses, etc. Vouchers covering these expenditures are made in the regular way and included in abstracts to the State Auditor and State Treasurer for reimbursement of the funds.

IN RE J. D. BREN, TREASURER

On June 2, 1911, the Public Examiner took charge of the funds of Treasurer J. D. Bren, depositing the same with the Minnesota Loan and Trust Company, and such as were involved were not released until February, 1912.

Amounts and Disposition

Received from Bonding Company.....	\$14,310.70
Found in vault June 9th.....	4,990.00
Turned over to Public Examiner by Attorney for J. D. Bren, \$710.00 and \$360.98.....	1,070.98
Deposit Minnesota Loan and Trust Company.....	220.87
Certificate of Deposit Minnesota Loan and Trust Company.....	4,500.00
Interest.....	633.18
	<hr/>
	\$25,725.73
Remitted to State Treasurer:	
January 31, State Auditor's Draft 97937.....	\$14,310.70
February 27, State Auditor's Draft 98741.....	9,401.96
	<hr/>
	\$23,712.66

Which Remittances were Credited to Funds:		
University Support.....		\$21,261.76
Covering items: Sanford Hall.....	\$ 4,790.31	
Tuition Fees.....	1,249.52	
Dental Infirmary.....	3,707.05	
General Univer-		
sity Miscellane-		
ous	181.33	
Swimming Pool		
University Gym-		
nasium.....	10.00	
Printing Theses....	31.00	
Breakage Deposit.....	11,292.55	
University Campus Rents.....		1,848.40
Repairs University.....		401.93
Elliot Hospital Building		113.37
University Extension Work.....		49.60
University Heating Plant.....		37.60
		<hr/>
		\$23,712.66
Credited University Contingent Fund for Adjustment of Accounts as follows:		\$2,013.07
Contingent Fund Shortage.....	\$ 391.31	
Minnesota Union (four accounts)....	1,231.50	
Debating Board.....	54.46	
Y. M. C. A. Systematic Giving.....	21.65	
Flower Accounts, Janitors, etc.....	6.90	
Henry Bruchholz Deposit .....	.50	
Military Ball Accounts.....	53.00	
Students' Benefit Funds.....	238.50	
Inter-Fraternity Council.....	15.25	
		<hr/>
		\$2,013.07

SYNOPSIS FROM THE REPORT OF THE SUPERINTENDENT OF
BUILDINGS AND GROUNDS

Considerable time could be saved by having a shop fully equipped with wood working machinery for making special cases, tables, shelving, etc., which can not be selected from standard stocks. The largest item of expense the coming year should be the rewiring of buildings, some of which were wired years ago; extensions have been made from time to time, and the feeders now installed are inadequate to the service rendered. The buildings most in need of re-wiring are the Mechanic Arts Building, Law Building, Library, Pillsbury Hall, Armory, and Mechanical Engineering Building. The Law Building should have new feeders, new main and distributing panels. The wing, which includes the large

reading room and library, is lighted entirely by gas which impoverishes the air, thereby making the room uncomfortable. The Library Building is supposed to be fire-proof, but the book cases in the stack room are all of wood construction and the wiring is all open work with drop cords. The load is exceedingly heavy for the present mains and a complete new installation in conduit with new distributing panels and cabinets should be provided. The wiring in Pillsbury Hall is all open work with drop cords. Branches have been added as needed, overloading the present mains, and conduit installation should be made. The Armory is an exceedingly hazardous building. The wiring is all tube and cleat work, the feeders are overloaded, and the installation of a new system is imperative. The estimated cost for the installation of the new wiring system is \$15,000.

The heating of most of the buildings on the old campus is wasteful. I would earnestly recommend that a thermostatic temperature control be installed in most of the buildings on the old campus, and included in the construction of all new buildings.

TABLE I

SUMMARY OF REPAIRS

	Labor	Material	Supplies	Total
Mechanic Arts Building	\$1,179.62	\$ 984.21	\$102.63	\$2,266.46
Pillsbury Hall.....	502.23	378.05	144.71	1,024.99
Law Building.....	1,132.99	662.23	80.03	1,875.25
Heating Plant.....	1,169.07	1,100.62	37.67	2,307.36
Chemistry Building....	431.06	235.67	95.32	762.05
Old Millard Hall.....	1,167.32	404.63	106.17	1,678.12
Medical Chemistry Building.....	46.51	34.50	12.07	93.08
Library Building.....	1,577.63	1,212.91	316.84	3,107.38
Ore Testing.....	34.64	68.14	.....	102.78
Dentistry and Medical Science.....	313.18	109.45	122.54	545.17
Armory.....	2,055.56	826.40	177.99	3,059.95
Observatory.....	16.22	9.23	.61	26.06
Mechanical Engineer- ing Building.....	184.95	86.66	125.95	397.56
Electrical Engineering Building.....	222.65	62.82	68.23	353.70
Physics Building.....	268.63	127.14	94.06	489.83
Barn.....	2.97	1.20	607.69	611.86
School of Mines Build- ing.....	158.72	43.79	44.02	246.53
Pathology Building....	518.73	220.97	98.06	837.76
Shevlin Hall.....	695.88	163.71	208.07	1,067.66
Folwell Hall.....	867.44	278.10	360.99	1,506.53

TABLE I—Continued

	Labor	Material	Supplies	Total
Greenhouse.....	\$ 34.82	\$ 16.87	\$ 29.34	\$ 81.03
Y. M. C. A. Building..	46.57	10.82	8.16	65.55
Animal House.....	68.47	88.47	.....	156.94
Sanford Hall.....	425.05	814.10	314.45	1,553.60
Experimental Building.	369.89	92.92	74.83	537.64
Main Engineering				
Building.....	57.05	.96	.....	58.01
Anatomy Building.....	180.66	119.35	.....	300.01
Millard Hall.....	40.07	15.71	.....	55.78
Miscellaneous				
Buildings.....	418.04	256.87	.....	674.91
Model School.....	62.44	15.31	9.45	87.20
Dissecting Building....	29.23	2.69	3.78	35.70
Art School.....	58.23	19.00	12.77	90.00
Tunnels.....	360.01	82.84	.....	442.85
Total.....	\$14,696.53	\$8,546.34	\$3,256.43	\$26,499.30

TABLE II

SUMMARY OF SPECIAL REPAIRS

	Labor	Material	Supplies	Total
Pillsbury House.....	\$3,694.82	\$2,688.15	.....	\$ 6,382.97
Campus.....	8,058.12	2,323.24	.....	10,381.36
Hospital.....	3,209.45	1,205.00	.....	4,414.45
Miscellaneous Hospital				
Buildings.....	676.40	453.35	.....	1,129.75
New Heating Plant....	37.32	109.72	.....	147.04
Free Dispensary.....	328.50	156.23	.....	484.73
Total Buildings not chargeable to Re- pair Fund.....	\$16,004.61	\$6,935.69	.....	\$22,940.30

TABLE III

SUMMARY OF INVENTORY OF PROPERTY OF THE UNIVERSITY OF MINNESOTA

As of July 31, 1912

NAME OF DEPARTMENT	TOTAL	SCIENTIFIC APPARATUS	TOOLS, MACHINERY	PICTURES AND BOOKS	FURNITURE	LIVE STOCK	EXPENDABLE SUPPLIES	BUILDINGS	LANDS	MISCELLANEOUS
General University.....	\$304,117	\$756	\$5,939	\$222,387	\$36,824	.....	\$466	.....	.....	\$37,745
College of Science, Literature, and the Arts.....	467,608	180,327	5,646	163,360	50,995	.....	8,070	.....	.....	59,210
College of Engineering.....	207,716	76,187	84,008	27,746	12,606	.....	3,969	.....	.....	3,200
College of Medicine and Surgery.....	254,465	146,087	15,426	37,818	26,373	\$3	20,184	.....	.....	8,574
School of Chemistry.....	49,278	26,355	839	4,686	1,591	.....	15,807	.....	.....	.....
School of Mines.....	62,481	14,342	26,650	10,062	9,942	.....	1,485	.....	.....	.....
College of Dentistry.....	19,091	6,993	2,127	1,220	3,434	.....	5,317	.....	.....	.....
Law School.....	84,149	155	.....	81,082	2,812	.....	100	.....	.....	.....
College of Pharmacy.....	19,628	8,522	.....	2,780	3,493	.....	4,833	.....	.....	.....
College of Education.....	4,627	596	82	1,452	2,434	.....	63	.....	.....	.....
College of Agriculture.....	370,979	37,028	50,008	82,457	99,194	54,798	30,237	.....	.....	17,257
Total Equipment.....	1,844,139	497,348	190,725	635,050	249,698	54,801	90,531	.....	.....	125,986
LANDS AND BUILDINGS:										
University Campus.....	4,577,220	.....	.....	.....	.....	.....	.....	\$2,577,220	\$2,000,000	.....
University Farm.....	1,156,099	.....	.....	.....	.....	.....	.....	885,142	270,957	.....
Experiment Station.....	507,040	.....	.....	.....	.....	.....	.....	370,090	136,950	.....
Land Grants and Miscellaneous.....	1,681,053	.....	.....	.....	.....	.....	.....	23,125	1,657,928	.....
Total Lands and Buildings..	7,921,412	.....	.....	.....	.....	.....	.....	3,855,577	4,065,835	.....
Grand Total of Property.....	9,765,551	497,348	190,725	635,050	249,698	54,801	90,531	3,855,577	4,065,835	125,986

UNIVERSITY LANDS

In accordance with the resolution of the Board of Regents of February 12, 1912, Mr. Luth Jaeger has for some time been engaged upon an examination of the records of this office and of the office of the State Auditor with a view to ascertaining the exact status of the various real estate holdings of the University. The work has gradually widened in its scope and the results will eventually show by records and maps the history and present condition of all the lands and of other realty which have been and are now owned by the University. A brief summary of the more important features of the examination follows:

Salt Spring lands.—The records in this office have been carefully checked, indexed, and verified. There remains unsold 4,625.64 acres and there is still due from the government 1,149.40 acres. Congressional action will be invoked to make up this shortage should the General Land Office persist in its refusal to render relief. Selections have been prepared and will be submitted to the proper authorities in the near future.

University lands.—These lands being managed by the office of the State Auditor, no records or data of any kind concerning them have ever been available at this office. Steps are, however, in progress to remedy this defect and when the present investigation is closed, complete records and data will be on hand here. There still remains unsold 18,946.07 acres, of which 2,400 acres are mineral lands leased to private parties. A shortage of about 635.1 acres due the University from the government has been disclosed and measures will be taken to make the necessary selections.

Mineral leases.—There are at this writing in force 22 mineral leases covering, as above mentioned, 2,400 acres. The merchantable tonnage of ore contained therein is computed at 5,084,764 tons, and the non-merchantable tonnage at 6,615,355 tons. The former is assessed by the Tax Commission at \$461,889, while the non-merchantable tonnage is of such uncertain value that it has been thought best not to venture an estimate. One hundred and thirty-four leases have been canceled for non-payments. The annual receipts from permits, royalties, and leases now aggregate approximately \$100,000 per annum which is credited to the permanent University fund, the interest only being available for University maintenance. An effort should be made to make the mineral land of the State more productive and to that end legislation should be sought to authorize the State Auditor to make leases under such restrictions as will enforce operations.

The University Campus.—The University Campus is the result of a number of acquisitions beginning in 1854 and continuing down until two years ago when the last enlargement took place. It is the intention to prepare a map showing in colors and chronological order as far as may be, the growth of the Campus.

The area of University property.—The University Campus, the Department of Agriculture Campus and Farm, and the various Experiment Stations (not including Government Land Grants) aggregate 4,456.75

acres. Unsold lots in the Regents' Addition, Minneapolis, and lots in St. Paul received from the Ludden Estate, in all valued at approximately \$50,000, are being negotiated for long leases.

THE UNIVERSITY TRUST FUNDS

Prepared by D. W. Sprague

THE GILFILLAN TRUST FUND

This fund of \$50,000 is the gift of the Hon. John B. Gilfillan, of Minneapolis, to the University of Minnesota, the income from which shall be at the disposal of the Executive Committee of its Board of Regents, either as a gift or a temporary loan to University students who are residents of Minnesota.

The fund is invested in four per cent Minneapolis, St. Paul and Sault Ste. Marie Railway Company's bonds, the income from which is \$2,000 per annum, payable semi-annually. The income is loaned to students on their notes in amounts not exceeding \$200 to any one person in one year, at the rate of five per cent per annum.

CLASSIFICATION OF STUDENTS WHO HAVE RECEIVED AID FROM THIS FUND

The number of men who have received aid from the Gilfillan Fund	178
The number of women who have received aid from the Gilfillan Fund	58
Total.....	236
Number of students who have received gifts.....	2
Number of students who have paid their loans in full.....	89
Number of students whose loans are due, who have paid nothing..	26
Number of students whose loans are due, who have paid something	70
Number of students whose loans are not yet due.....	58
Total.....	245
Less 9 duplicates entered twice.....	9
Total number of students who have received aid from this fund	236

INTEREST RECEIPTS

The Gilfillan Fund of \$50,000 is invested in four per cent bonds payable semi-annually. The annual interest is therefore, \$2,000. The bonds were received in 1902 and have been on interest from 1902 to 1912 inclusive, a period of eleven years; \$2,000 per year for eleven years gives a total interest of \$22,000.

RECEIPTS BY YEARS

	Interest	Collections from Students	Totals
For year ending July 31, 1902.....	\$2,000.00	\$ 25.42	\$2,025.42
For year ending July 31, 1903.....	2,000.00	137.75	2,137.75
For year ending July 31, 1904.....	2,000.00	104.39	2,104.39
For year ending July 31, 1905.....	2,000.00	442.75	2,442.75
For year ending July 31, 1906.....	2,000.00	708.02	2,708.02
For year ending July 31, 1907.....	2,000.00	1,378.46	3,378.46
For year ending July 31, 1908.....	2,000.00	643.46	2,643.46
For year ending July 31, 1909.....	2,000.00	1,098.86	3,098.86
For year ending July 31, 1910.....	2,000.00	2,561.26	4,561.26
For year ending July 31, 1911.....	2,000.00	1,550.53	3,550.53
For year ending July 31, 1912.....	2,000.00	2,630.39	4,630.39
Totals.....	\$22,000.00	\$11,281.29	\$33,281.29

DISBURSEMENTS

	Loans to Students	Expenses of Administration	Totals
For year ending July 31, 1902.....	\$1,030.00	\$19.94	\$1,049.94
For year ending July 31, 1903.....	1,410.00	10.00	1,420.00
For year ending July 31, 1904.....	1,605.00	10.75	1,615.75
For year ending July 31, 1905.....	3,370.00	44.50	3,414.50
For year ending July 31, 1906.....	2,486.00	1.00	2,487.00
For year ending July 31, 1907.....	3,160.00	.....	3,160.00
For year ending July 31, 1908.....	3,183.00	.....	3,183.00
For year ending July 31, 1909.....	2,890.00	.....	2,890.00
For year ending July 31, 1910.....	2,995.00	3.40	2,998.40
For year ending July 31, 1911.....	4,250.00	.....	4,250.00
For year ending July 31, 1912.....	5,052.00	.....	5,052.00
Totals.....	\$31,431.00	\$89.59	\$31,520.59
Total Receipts.....	\$33,281.29		
Total Disbursements.....	31,520.59		

Total receipts less total disbursements
 equals balance on hand August 1,
 1912..... \$1,760.70

STATEMENT OF EXPENSES IN ADMINISTERING THE FUND IN DETAIL

Rent of deposit vault for bonds, four years.....	\$32.00
One 500-page Journal, \$7.25; three promissory note books at \$1.00, \$3.00.....	10.25
Printing of circular letters, blanks, \$3.50; rubber stamp and pad, \$0.44.....	3.94
Lettering Journal, \$1.50, two typewritten state- ments, \$2.00.....	3.50

Express on bonds to New York for registration and return.....	\$37.50	
Exchange on country checks, \$1.15; refund to Ralph Kerns, \$1.25.....		2.40
		<hr/>
Total expenses of administration.....		\$89.59

CLASSIFICATION OF LOANS MADE TO STUDENTS

Total gifts to students.....	\$	450.00	
Amount of loans which have been paid in full....		7,152.00	
Loans past due upon which nothing has been paid		2,669.00	
Loans past due upon which something has been paid.....		10,818.00	
Loans not yet due.....		10,342.00	
		<hr/>	
Total gifts and loans to students paid and unpaid..			\$31,431.00

STATEMENT OF COLLECTIONS FROM STUDENTS

	Capital	Interest
Loans which have been paid in full.....	\$7,152.00	\$ 986.56
Loans due upon which something has been paid...	945.89	1,678.58
Loans not due upon which something has been paid.....	128.00	390.26
	<hr/>	<hr/>
Totals.....	\$8,225.89	\$3,055.40
Paid on Principal.....	\$8,225.89	
Paid on Interest.....	3,055.40	
	<hr/>	<hr/>
Total Collections.....		\$11,281.29

THE ELLIOT SCHOLARSHIP LOAN FUND

This fund of \$5,000 is the gift of Mrs. Mary H. Elliot, wife of Dr. A. F. Elliot, of Los Angeles, California, but formerly of Minneapolis, to the University of Minnesota, the income from which shall be placed in the hands of its Board of Regents to be used as a scholarship loan fund for assisting young men in the School of Mines. These loans are made to students on their notes to be repaid as soon as they may be able, but without interest. The annual income from the fund is at present \$200 and the amount loaned to students varies from \$25 to \$200. This fund of \$5,000 remained in the hands of Mrs. Elliot from 1901, the year in which the gift was made, until her death, late in 1904, the income of \$250 having been paid regularly to the Board of Regents. On February 3, 1905, the fund of \$5,000 was formally placed in the hands of the Regents by the executor of the Elliot estate and was deposited by them with the Northwestern National Bank of Minneapolis for investment, where it remained on interest until May 31, 1906.

On May 31, 1906, the principal and accumulated interest to date was.....	\$5,329.75	
On May 31, 1906, were purchased five \$1,000 Northern Pacific 4 per cent bonds.....	5,207.74	
	<hr/>	
Leaving a balance unexpended of.....		\$122.01

STATEMENT OF RECEIPTS BY YEARS

	Interest	Collections from students	Total receipts
Interest received from Mrs. Elliot for 1902	\$250.00	.....	\$250.00
Interest received from Mrs. Elliot for 1903	250.00	\$ 50.00	300.00
Interest received from Mrs. Elliot for 1904	250.00	265.00	515.00
Interest received from Mrs. Elliot for 1905	250.00	200.00	450.00
Interest received for quarter ending June 30, 1906.....	{ 50.00	.....	.....
Balance after purchase of bond.....	{ 122.01	.....	172.01
Interest received on bonds for year 1907..	200.00	125.00	325.00
Interest received on bonds for year 1908..	200.00	300.00	500.00
Interest received on bonds for year 1909..	200.00	175.00	375.00
Interest received on bonds for year 1910..	200.00	130.00	330.00
Interest received on bonds for year 1911..	200.00	70.00	270.00
Interest received on bonds for year 1912..	200.00	185.00	385.00
	<hr/>	<hr/>	<hr/>
Total receipts.....	\$2,372.01	\$1,500.00	\$3,872.01

STATEMENT OF RECEIPTS AND DISBURSEMENTS BY YEARS

	Receipts	Disbursements
For year ending July 31, 1902.....	\$250.00	\$250.00
For year ending July 31, 1903.....	300.00	268.00
For year ending July 31, 1904.....	515.00	500.00
For year ending July 31, 1905.....	450.00	350.00
For year ending July 31, 1906.....	172.01	.....
For year ending July 31, 1907.....	325.00	300.00
For year ending July 31, 1908.....	500.00	100.00
For year ending July 31, 1909.....	375.00	75.00
For year ending July 31, 1910.....	330.00	625.00
For year ending July 31, 1911.....	270.00	125.00
For year ending July 31, 1912.....	385.00	400.00
	<hr/>	<hr/>
Totals.....	\$3,872.01	\$2,993.00
Total interest received (see previous table).....	\$2,372.01	
To which add collections (see previous table).....	1,500.00	
	<hr/>	
Gives total receipts.....		\$3,872.01

Total loans made.....	\$2,990.00	
Expenses of administration.....	3.00	
		<hr/>
Gives total disbursements.....		\$2,993.00
		<hr/>
Receipts less disbursements gives bal- ance on hand.....		\$879.01
Loans outstanding August 1, 1912.....	\$1,490.00	
Loans paid to August 1, 1912.....	\$1,500.00	
		<hr/>
Equals total loans made.....		\$2,990.00

THE LUDDEN TRUST FUND

This fund of \$10,000 is the gift of the Hon. John D. Ludden of St. Paul, to the University of Minnesota, the income from which was placed at the disposal of its Board of Regents to aid worthy students of either sex belonging to the School of Agriculture. The fund is invested in Northern Pacific bonds drawing four per cent interest payable quarterly. The annual interest is \$400.00.

Mr. Ludden's purpose and wish was "that the income should be used as a gift to the financial assistance of students" and it was so used from 1902 to 1910. Since 1910 the Regents have pursued a different policy and the income from the fund is now being loaned to its beneficiaries and notes are taken for such loans.

This course was decided upon after a closer examination of the language used by Mr. Ludden, by which the Board of Regents "were empowered to make such rules as they may deem judicious and making final and conclusive such action as the Board or its Executive Committee might take in the matter," for the Board had for some time realized that as a means of encouraging thrift and developing character, a loan was more efficacious than a gift, a fact, by the way, which some of the beneficiaries of the fund prior to this period had themselves recognized, refusing to accept the assistance offered except as a loan.

CLASSIFICATION OF STUDENTS WHO HAVE RECEIVED AID
FROM THIS FUND

Number of students who have received gifts only.....	14
Number of students who have received loans only.....	25
Number of students who have received both gifts and loans.....	9
	<hr/>
Total number of beneficiaries.....	48

CLASSIFICATION OF DISBURSEMENTS

	Gifts	Loans
Amount paid to students who have received gifts only.....	\$980.00	
Amount paid to students who have received loans only.....		\$1,660.00
Amount paid to students who have received both gifts and loans.....	420.00	665.00
Totals.....	\$1,400.00	\$2,325.00
Total gifts and loans.....		\$3,725.00

TOTAL RECEIPTS AND DISBURSEMENTS FROM OCTOBER 1, 1902
TO JULY 31, 1912

	Interest received	Collections from students	Disbursements
For year ending July 31, 1903.....	\$200.00	.....	\$ 3.75
For year ending July 31, 1904.....	250.00	.....	100.00
For year ending July 31, 1905.....	400.00	.....	90.00
For year ending July 31, 1906.....	400.00	.....	270.00
For year ending July 31, 1907.....	400.00	.....	150.00
For year ending July 31, 1908.....	400.00	.....	260.00
For year ending July 31, 1909.....	400.00	.....	630.00
For year ending July 31, 1910.....	400.00	\$101.00	1,220.00
For year ending July 31, 1911.....	400.00	52.81	706.00
For year ending July 31, 1912.....	400.00	247.02	300.00
Totals.....	\$3,650.00	\$400.83	\$3,729.75
Total interest receipts.....	\$3,650.00		
Total collections from students....	400.83		

Total receipts.....	\$4,050.83
Less total disbursements.....	3,729.75

Equals balance on hand July 31, 1912..... \$321.08

Some of the beneficiaries of the Ludden Fund, refusing to accept the assistance received as a gift, have paid therefor by their promissory notes. At the request of the Regents these notes and some cash collections were added to the Ludden Fund. On March 7, 1910, Mr. J. A. Vye, Treasurer, School of Agriculture, turned over to the Accountant of the University

One check for.....	\$ 89.55
Ten promissory notes amounting to....	540.00

Making a total of..... \$629.55

There has been collected on these notes including the check of \$89.55 from Mr. Vye.....		
		\$351.22
Balance on hand from Ludden Fund, July 31, 1912.....		321.08
		<hr/>
Balance on hand Ludden Fund August 1, 1912.....		\$672.30
Total amount of outstanding notes August 1, 1912.....		\$2,170.00

THE SHEVLIN FELLOWSHIPS

The Fellowship Fund amounting to \$40,000 is the gift of the Hon. Thomas H. Shevlin, of Minneapolis. Its object is the establishing of four fellowships as follows: one Academic, one in Agriculture, one in Chemistry, and one in Medicine, each being the income of \$10,000 or \$500.

The committee to whom the matter was referred reported that the fellowships be graduate fellowships and that they be under the jurisdiction of the Graduate Department of the University.

The fund is invested in Shevlin-Mathew Lumber Company bonds drawing five per cent interest payable semi-annually; \$1,000 in August and \$1,000 in February of each year. The first income from the fund was received on February 1, 1911 at the commencement of the second semester, when the whole income for the year, \$2,000, was received.

Four fellows were appointed for the year 1910-11, only two of whom were able to accept.

FINANCIAL STATEMENT

Receipts

Total income from the fund for 1910-11.....	\$2,000.00
Total income from the fund for 1911-12.....	2,000.00
	<hr/>
Total receipts.....	\$4,000.00

Disbursements

Two students only accepted appointment for 1911 at \$500.....	\$1,000.00
Five fellows appointed for 1912 at \$500.....	2,500.00
	<hr/>
	\$3,500.00
Balance unexpended August 1, 1912.....	\$500.00

THE GIDEON MEMORIAL PRIZE FUND

The State Horticultural Society contributed \$500 as a memorial of Peter M. Gideon, the pioneer in developing new varieties of fruit in Minnesota and the originator of the Wealthy apple.

The fund is invested in City of Grand Rapids, Minnesota, bonds, drawing five per cent interest, the income from which is to be expended annually by the Department of Horticulture for the three best essays on some subject previously assigned, relating to horticulture, as follows: for the best essay, \$12.00; the second best, \$8.00; the third best, \$5.00. The interest, amounting to \$25, is payable semi-annually in June and in December.

FINANCIAL STATEMENT

Receipts

Annual interest for year ending July 31, 1910.	\$25.00	
Annual interest for year ending July 31, 1911.	25.00	
Annual interest for year ending July 31, 1912.	25.00	
	<hr/>	
Total receipts.		\$75.00

Disbursements

Sept. 2, 1910 paid for books offered as prizes.	\$ 9.95	
Jan. 10, 1911 for three prizes in checks.	25.00	
Dec. 16, 1912 for three prizes in checks.	25.00	
	<hr/>	
Total disbursements.		\$59.95
		<hr/>
Balance unexpended August 1, 1912.		\$15.05

TABLE IV
 RECEIPTS AND DISBURSEMENTS, UNIVERSITY TRUST FUNDS

Name and description of fund	Total principal and additions to beginning of year	Received during year	Total	Income expended during year	Total principal and additions at end of year	Amount of outstanding loans August 1, 1912
<i>The Gilfillan Trust Fund:</i> \$50,000, gift of the Hon. John B. Gilfillan, Minneapolis, Minn. Income to be used as a gift or temporary loan to resident students.	\$52,182.31	\$4,630.39	\$56,812.70	\$5,052.00	\$51,760.70	\$23,206.00
<i>The Ludden Trust Fund:</i> \$10,000, gift of the Hon. John D. Ludden, St. Paul, Minn. Income to be used to aid students of the School of Agriculture.	10,145.28	827.02	10,972.30	300.00	10,672.30	2,170.00
<i>The Elliot Scholarship Loan Fund:</i> \$5,000, gift of Mrs. Mary H. Elliot, of Los Angeles, Cal., formerly of Minneapolis, Minn. A scholarship fund for assisting young men in the School of Mines.	5,894.01	385.00	6,279.01	400.00	5,879.01	1,490.00
<i>The Shevlin Fellowships:</i> \$40,000, gift of the Hon. Thomas H. Shevlin, of Minneapolis, Minn. Divided into four graduate fellowships of \$10,000 each, Academic, Agriculture, Chemistry, and Medicine.	41,400.00	2,000.00	43,400.00	2,900.00	40,500.00	Gifts only are made
<i>Albert Howard Scholarship Fund:</i> \$4,000, gift of the Hon. James T. Howard, of St. Johnsbury, Vermont, for establishing a scholarship in memory of his son, Albert Howard.	4,000.00	240.00	4,240.00	240.00	4,000.00	Gifts only are made
<i>Peter Gideon Memorial Prize:</i> \$500, given by the State Horticultural Society. Income to be used for prizes in Horticulture at the School of Agriculture.	502.55	25.00	527.55	25.00	502.53	Gifts only are made

TABLE IV—Continued

Name and description of fund	Total principal and additions to beginning of year	Received during year	Total	Income expended during year	Total principal and additions at end of year	Amount of outstanding loans August 1, 1912
<i>William J. Bryan Prize Fund:</i> \$250, gift of the Hon. William J. Bryan. Income to be used as a prize for encouraging students in Political Science.	\$ 345.81	\$ 8.64	\$ 354.45	\$10.00	\$ 344.45	Gifts only are made
<i>The Rollin E. Cutts Memorial Fund:</i> \$500, gift of Mrs. Martha A. Cutts in memory of her husband. The annual income to be used to purchase a medal for the best thesis based on original work pursued in the College of Medicine and Surgery.	604.41	16.00	620.41	.....	620.41	Gifts only are made
<i>The John D. Ludden Estate:</i> Securities and realty valued at approximately \$10,000, bequeathed by the Hon. John D. Ludden, the income to be loaned to students at the School of Agriculture.	6,000.00	420.00	6,420.00	.....	6,420.00	Gifts only are made
<i>Governor Johnson Memorial Fund:</i> \$19,300, memorial fund raised in honor of the late Governor John A. Johnson, the widow of the deceased having a life interest in the income therefrom. The proceeds of the investment are turned over to her as soon as collected.	.....	.....	.....	.....	.....	.....

RECOMMENDATIONS

The present system of requiring signed pay-rolls is being quite generally discontinued. The entire University pay-roll includes upwards of four hundred individuals requiring approximately eight hundred signatures, which consumes much time and offers little, if any, protection. I should recommend that the law governing be amended, doing away with the signatures and adopting in lieu thereof the certificates of the Heads of Departments and Deans that the pay-rolls are correct and that the services included have been performed.

The reputation for prompt payment of accounts is most essential to the economic purchase of supplies. The legal restrictions make payments slow and unbusinesslike. A summary of the average time for payment is practically as follows:

From date of issue of invoice until received at business office....	3 days
Checking with orders and entering in necessary records.....	3 days
Average time in departments for checking supplies.....	7 days
Accumulating and writing up certificates.....	4 days
Average time in checking up certificates by firms and returning same.....	7 days
Including in vouchers and making abstracts.....	10 days
Abstracts can only be filed on the 5th and 20th. Average time lost.....	8 days
Average time in State Auditor's office in checking abstracts....	12 days
Average time in Treasurer's office drawing checks.....	2 days
Mailing checks and in transit.....	2 days

Total..... 58 days

A special effort has been made to lessen the delay and there is no doubt but that many invoices are paid in less time than above given, but in as many instances more time is taken.

If the law could be amended and a system adopted that would enable purchases being made on a strictly cash basis and advantage of the two per cent cash taken, it would result in a large saving and at the same time greatly facilitate the work in the Business Office, as a continual checking on all invoices is necessary until payment is made.

TABLE V

RECAPITULATION OF ALL FUNDS

Balance August 1, 1911, Maintenance Funds	\$ 109,288.54	
Receipts (not including transfers, etc.)....	1,435,972.93	
Balance August 1, 1911, Building and Equipment Funds.....	1,181,388.64	
Receipts.....	1,102,814.11	
Balance and Sales Agricultural Book Store.	15,263.16	
Dining Halls, etc.....	135,616.64	
		<hr/>
Total.....		\$3,980,344.02
Maintenance Expenditures.....	\$1,304,116.75	
Buildings and Equipment.....	1,001,522.25	
Expended for Books, etc., Agricultural Book Store.....	10,670.15	
Balance Maintenance Funds.....	237,892.70	
Balance Building Funds.....	1,075,562.44	
Balance Agricultural Book Store.....	4,593.01	
Dining Hall Receipts, Treated as Expen- ditures (the Dining Halls and Dormi- tories are not operated with a view to making any profits and charges for use of buildings, heat, light, etc., would more than absorb balances).....	135,616.64	
Adjustments—Deductions debits in excess deductions credits:		
Maintenance Funds.....	3,252.02	
Building and Equipment Funds.....	207,118.06	
		<hr/>
		\$3,980,344.02

TABLE VI

CLASSIFICATION BY COMMODITY

Salaries.....	\$814,851.89	
Wages.....	142,329.88	
Miscellaneous Labor.....	36,070.39	
Fuel.....	72,728.55	
Electricity.....	7,609.03	
Gas.....	5,507.53	
Water.....	3,684.38	
Library.....	30,183.21	
Interest and Assessments.....	17,196.93	
Freight and Express.....	6,315.56	
Traveling Expenses.....	18,058.19	
Postage, Telephone and Telegraph.....	11,200.55	
Publications and Bulletins.....	8,046.37	
Office Equipment, Stationery, and Printing.....	21,748.72	
Provisions.....	72,755.10	
Feed.....	18,626.56	
Household and Dormitories.....	16,529.66	
Supplies for Instruction.....	51,443.71	
Seeds and Plants.....	1,660.79	
Live Stock.....	11,871.08	
Scientific Apparatus and Instruments.....	20,952.82	
Furniture and Furnishings.....	9,456.33	
Tools, Implements, and Machinery.....	9,686.03	
Campus Extension and Tunnels.....	41,849.29	
Campus Maintenance.....	3,717.30	
Repairs.....	31,117.34	
New Buildings and Reconstruction.....	845,472.52	
Mechanical Equipment of Buildings.....	89,612.00	
Miscellaneous Supplies.....	20,973.93	
		\$2,441,255.64
Certificates of Indebtedness Redeemed....	\$200,000.00	
Net Maintenance Expense.....	\$1,304,116.75	
Net Buildings and Equipment.....	1,001,522.25	
Dining Halls, etc.....	135,616.64	
		\$2,441,255.64

NOTE: The redemption of the certificates of indebtedness is not included in the classification as the expenditure in no way adds to inventory. The money received from the certificates was expended in the purchase of property for campus extension and accounted for in previous reports.

MAINTENANCE

Explaining Table VII, pages 224 and 225

"What is the cost of maintenance per annum?" is a question frequently asked and one as difficult to answer as is the question of the cost of operation of a railroad or the "overhead" charges in manufacturing, for with nearly every purchase of furniture, equipment, or apparatus, a debatable question as to "replacement" or "addition to inventory" is furnished. In the classification of vouchers covering supplies received during the fiscal year, each invoice has been considered and the division made according to our best judgment. An arbitrary division of the funds has been made for summarizing expenditures (Tables XII and XVI) which is a close check on the classification. On account of lack of uniformity in the taking of inventories in the past and the adoption of a new method and basis for the inventory of August 1, 1912, no deductions can be made for comparison with the table of maintenance cost. The "difference between the adjustments of credits and debits in the summary," in reconciling Table of Maintenance Cost, is included to adjust the figures to correspond with the summary of Ledger Balances, July 31, 1912. Reference to Tables XIV and XV will afford further explanation.

Two items in "Analysis of Balance" need further explanation: (a) Outstanding orders and contracts. The policy of postponing the purchase of much-needed, but not absolutely necessary equipment and apparatus until the ordinary supplies had been procured and the status of budget funds found to warrant such purchase has resulted in placing many orders near the close of the year; also many orders from abroad and for special books and apparatus given during the year remain unfilled. (b) "Advance from 23-100 mill tax." The first advance was made during the fiscal year closing July 31, 1911, was deducted from the appropriation available August 1, 1911, and a new advance made near the close of the year. Unless the University maintains a sufficient balance to return the advances from the early receipts from the June settlement, loans for meeting a portion of May and all of June expenses will be necessary as in past years.

TABLE VII

MAINTENANCE

For explanation, see page 223

<i>Income</i>	
FROM STATE: Bal. August 1, 1911	\$ 109,288.54
<i>Standing Appropriations—</i>	
23-100 Mill Tax.....	\$285,792.71
Mines Support.....	9,500.00
Fruit Farm.....	2,000.00
	<hr/>
	\$297,292.71
<i>Annual Appropriations—</i>	
General Support.....	\$325,000.00
Sundry Special Support....	379,850.00
	<hr/>
	704,850.00
<i>Interest on Investments—</i>	
Swamp Land Interest.....	\$10,968.72
Federal Land Grants.....	57,328.44
	<hr/>
	68,297.16
FROM FEDERAL GOVERNMENT:	
Morrill and Nelson Funds..	\$50,000.00
Adams Fund.....	15,000.00
Hatch Fund.....	10,000.00
	<hr/>
	75,000.00
STUDENTS' FEES, SALES, etc.:	
Tuition and Incidental Fees (net).....	\$173,878.48
Sales from Farm Products .	69,776.74
Rents from Campus Houses.	14,622.61
Miscellaneous Income	
Funds Restored, also trans. 38.....	32,255.23
	<hr/>
	290,533.06
Total Income.....	<hr/> 1,435,972.93
Total Available.....	<hr/> <hr/> \$1,545,261.47

TABLE VII

MAINTENANCE

For explanation, see page 223

Expenses

General University (Administration, business management, care of buildings, repairs, heat, light)	\$255,828.21	
Science, Literature, and the Arts.....	249,972.38	
Engineering.....	71,527.26	
Agriculture (including Sub-Stations).....	433,430.22	
Law.....	32,212.97	
Medicine and Surgery { College \$98,995.92		165,084.99
{ Hospital 66,089.07		
Dentistry.....	39,281.29	
Pharmacy.....	11,801.11	
Mines.....	34,510.81	
Chemistry.....	40,735.50	
Education.....	17,781.46	
Graduate School.....	2,720.53	
		<hr/>
Total Maintenance.....		\$1,354,886.73
Reconciling with "Debits" as shown in summary above includes July bills abstracted but not paid until after August 1st.....	\$22,025.29	
Purchase of equipment apparatus from special equipment funds, replacement, etc., and properly chargeable to departments.....	28,744.69	
		<hr/>
		50,769.98
		<hr/>
Maintenance per summary.....		\$1,304,116.75
Difference between adjustment of credits and debits in summary.....		3,252.02
<i>Analysis of Balance:</i>		
Bills payable (approximated).....	\$23,387.00	
Government funds received July 1st, balance belonging to succeeding year.....	47,300.77	
Outstanding orders and contracts.....	61,728.90	
Advance from 23-100 mill tax.....	100,000.00	
Unappropriated balance.....	5,476.03	
		<hr/>
		237,892.70
		<hr/>
Ledger balances per summary.....		\$1,545,261.47

TABLE VIII

DISTRIBUTION OF NET FEES—UNIVERSITY ONLY

College of Science, Literature, and the Arts...	\$43,762.40
College of Engineering.....	15,959.90
College of Medicine and Surgery.....	22,338.00
School of Chemistry.....	3,638.25
School of Mines.....	4,676.75
College of Dentistry.....	35,053.17
Law School.....	17,207.84
College of Pharmacy.....	4,306.30
College of Education.....	1,836.50
Graduate School.....	1,080.85
General Deposits.....	6,569.54
Extension Division.....	300.00
Summer Session.....	7,017.40
	<hr/>
	\$163,746.90

The above includes fees credited to University Support Fund only. Collections of Economic Extension fees credited to special funds, amounting to \$2,626.10, were treated as miscellaneous receipts. See item 29, Table XX.

TABLE IX
DEPARTMENT EXPENDITURES

	Supplies	Salaries	Wages	Total
University General Administration.....	\$ 22,380.21	\$38,142.80	\$ 2,909.15	\$ 63,432.16
University Library.....	11,805.69	15,700.00	781.45	28,287.14
University Summer School.....	513.38	7,425.00	.....	7,938.38
University Buildings and Grounds.....	109,039.83	3,000.00	44,130.70	156,170.53
General Academic.....	620.53	5,565.00	.....	6,185.53
Department of Mathematics.....	134.74	11,325.00	.....	11,459.74
Department of Rhetoric.....	524.67	21,409.99	.....	21,934.66
Department of Art.....	142.51	2,500.00	.....	2,642.51
Department of Astronomy.....	58.40	3,225.00	.....	3,283.40
Department of Animal Biology.....	2,483.41	13,600.00	720.00	16,803.41
Department of Botany.....	4,018.63	13,755.50	.....	17,774.13
Department of English.....	561.76	11,825.00	.....	12,386.76
Department of Economics and Political Science.....	2,403.72	23,510.00	.....	25,913.72
Department of Semitics.....	.....	600.00	.....	600.00
Department of Geology.....	4,451.35	13,930.03	.....	18,381.38
Department of German.....	341.29	16,450.00	.....	16,791.29
Department of Greek.....	35.86	3,850.00	.....	3,885.86
Department of History.....	755.90	13,100.00	.....	13,855.90
Department of Latin.....	270.29	7,200.00	.....	7,470.29
Department of Music.....	267.50	2,500.00	.....	2,767.50
Department of Military Science.....	1,958.40	3,027.55	.....	4,985.95
Department of Comparative Philology.....	129.97	3,025.00	.....	3,154.97
Department of Philosophy.....	507.50	10,725.00	.....	11,232.50
Department of Physics.....	2,504.83	11,950.00	960.00	15,414.83

TABLE IX—Continued

	Supplies	Salaries	Wages	Total
Department of Physical Culture (Men).....	\$ 214.96	\$ 4,445.00	.....	\$ 4,659.96
Department of Physical Culture (Women).....	123.55	3,650.00	.....	3,773.55
Department of Romance Languages.....	120.22	12,855.00	.....	12,975.22
Department of Scandinavian Languages.....	329.23	4,400.00	.....	4,729.23
Department of Sociology and Anthropology.....	22.09	6,888.00	.....	6,910.09
Department of General Engineering.....	944.15	8,763.00	.....	9,707.15
Department of Civil Engineering.....	1,080.92	11,750.00	.....	12,830.92
Department of Mechanical Engineering.....	1,794.64	11,900.00	\$ 950.00	14,644.64
Department of Electrical Engineering.....	2,274.64	7,075.00	.....	9,349.64
Department of Drawing.....	73.25	5,325.00	.....	5,398.25
Department of Experimental Engineering.....	1,490.37	5,011.83	.....	6,502.20
Department of Mathematics.....	94.46	13,000.00	.....	13,094.46
Department of Graduate School.....	2,220.53	500.00	.....	2,720.53
General Medicine and Surgery.....	1,196.93	8,040.00	.....	9,236.93
Department of Anatomy.....	3,566.74	19,100.00	529.97	23,196.71
Department of Physiology and Pharmacology.....	2,219.76	16,780.00	1,940.00	20,939.76
Department of Pathology and Bacteriology.....	4,079.15	14,347.95	1,114.84	19,541.94
Department of Medicine.....	512.21	10,700.00	434.70	11,646.91
Department of Surgery.....	140.54	8,900.00	1,080.00	10,120.54
Department of Obstetrics.....	113.13	4,200.00	.....	4,313.13
Elliot Hospital.....	35,798.42	18,180.00	12,110.65	66,089.07
School of Chemistry.....	9,902.18	29,103.32	1,730.00	40,735.50
School of Mines.....	7,540.81	24,943.34	2,026.66	34,510.81
*College of Dentistry.....	1,601.29	36,790.00	890.00	39,281.29

*The above represents the difference between the receipts from Dental Infirmary and Supplies.

TABLE IX—Continued

	Supplies	Salaries	Wages	Total
Law School.....	\$ 7,490.70	\$24,140.79	\$ 581.48	\$32,212.97
College of Pharmacy.....	2,846.78	8,954.33	.....	11,801.11
College of Education.....	2,266.44	15,515.02	.....	17,781.46
Department of Agriculture—				
General Administration.....	6,683.13	14,322.50	.....	30,427.06
General School.....	1,620.24	10,687.19	.....	12,307.43
Library and Publications.....	5,355.11	3,420.42	914.00	9,689.53
Buildings and Grounds.....	19,597.27	960.00	5,394.90	16,530.74
Teachers' Summer School.....	523.50	1,483.00	.....	2,006.50
Miscellaneous.....	3,941.72	.....	.....	3,941.72
Farm Management.....	5,385.25	21,774.93	8,265.34	35,425.52
Chemistry and Soils.....	4,439.36	13,714.43	1,955.50	20,109.29
Extension.....	11,643.94	18,618.64	2,142.50	32,405.08
Engineering.....	11,028.11	19,223.33	9,477.60	39,729.04
Botany and Plant Pathology.....	1,269.40	7,161.49	1,035.43	9,466.32
Dairy and Animal Husbandry.....	28,724.42	28,597.69	3,540.65	60,862.76
English.....	220.73	4,100.00	.....	4,320.73
Entomology.....	1,165.16	6,799.83	60.00	8,024.99
Forestry.....	4,390.68	6,946.83	3,765.00	15,102.51
Home Economics.....	1,628.90	12,895.40	.....	14,524.30
Horticulture.....	1,820.79	11,194.62	6,455.34	19,470.75
Veterinary Science.....	5,097.02	8,888.60	1,548.60	15,534.22
Research in Economics.....	320.01	300.00	585.00	1,205.01
Crookston.....	23,246.03	13,086.41	3,926.27	40,258.71

TABLE IX—Continued

	Supplies	Salaries	Wages	Total
Grand Rapids.....	\$ 6,785.29	\$ 3,800.00	\$ 3,911.76	\$14,497.05
Morris.....	12,173.88	11,358.13	4,058.95	27,590.96
Total.....	\$413,028.40	\$811,931.89	\$129,926.44	\$1,354,886.73
Reconciling with debits as shown in summary above includes				
July bills abstracted but not paid until after August 1st...		22,025.29		
Purchase of Equipment and Apparatus from Special Equipment		28,744.69		
Funds, Replacement, etc., properly chargeable to Departments.				
				50,769.98
				<u>\$1,304,116.75</u>

TABLE X

RECONCILING BALANCE SUPPORT FUND WITH STATE
AUDITOR'S BOOKS

State Auditor's Balance, July 31, 1912.....		\$ 35,908.45
Advance 23-100 Mill Tax charged by State Auditor prior to August 1, 1912.		100,000.00
July Government Fund and Dining Hall Expenditures charged by State Auditor prior to August 1, 1912:		
Morrill Fund.....	\$2,083.31	
Nelson Fund.....	1,937.42	
Adams Fund.....	1,178.50	
Hatch Fund.....	716.64	
Farm Dining Hall.....	1,526.07	7,441.94
		<hr/>
		\$143,350.39
Government and Dining Hall Funds included in State Auditor's balance, but transferred on University books:		
Morrill Fund.....	\$25,000.00	
Nelson Fund.....	25,000.00	
Adams Fund.....	2,500.00	
Sanford Hall.....	1,000.00	
Shevlin Hall.....	1,000.00	
Farm Dining Hall.....	2,526.07	\$57,026.07
		<hr/>
Miscellaneous Trust Fund Interest credited on University books to Support Fund by error.....		100.00
Fees paid for collections by State Auditor, reported in letter of August 5, 1912.....	\$198.94	
And correctly on State Auditor's books.....	178.94	20.00
		<hr/>
Overtransfer on University books from Support Fund to Fuel Fund.....		4.87
		<hr/>
		57,150.94
		<hr/>
		\$86,199.45

TABLE XI

RECONCILING SUPPORT FUND BALANCE, AUGUST 1, 1911, WITH
STATE AUDITOR'S BALANCE

State Auditor's Balance, August 1, 1911.....	\$83,429.23	
University Ledger Balance, August 1, 1911..	61,051.18	
	<hr/>	\$22,378.05
Warrants issued by State Auditor August 1, 1911.....	\$22,616.13	
Charged by State Auditor, account fees for collections of interest, not charged on University books until after August 1, 1911.....	\$203.24	
Refund Land Interest to M. Schroeder, charged on State Auditor's books, but not on University books until after August 1, 1911.....	34.84	238.08
	<hr/>	<hr/>
		\$22,378.05

TABLE XII

SUMMARY OF MAINTENANCE FUNDS

	Balance Aug. 1, 1911	Credits to Support Fund	Total	Debits to Support Fund	Balance July 31, 1912
1. Support Fund.....	\$61,051.18	\$1,234,669.86	\$1,295,721.04	\$1,159,220.82	\$136,500.22
2. Special University Support.....	20,927.09	238,052.98	258,980.07	210,600.01	48,380.06
3. Special University Repairs.....	17,100.23	52,592.66	69,692.89	54,858.70	14,834.19
4. Special Agriculture Support.....	9,652.67	116,887.23	126,539.90	95,554.16	30,985.74
5. Special Agriculture Repairs.....	105.20	20,257.59	20,362.79	16,540.68	3,822.11
6. Sub-Station Support.....	452.17	102,280.51	102,732.68	99,362.30	3,370.38
Total.....	\$109,288.54	\$1,764,740.83	\$1,874,029.37	\$1,636,136.67	\$237,892.70
Transfers and entries other than receipts credited to accounts, Table XV..		\$328,767.90			
Transfers and entries other than expense charged to accounts, Table XIV..				\$332,019.92	
Net receipts.....		\$1,435,972.93			
Net expenditure for maintenance.....				\$1,304,116.75	

TABLE XIII

CREDITS TO MAINTENANCE FUNDS

	Item	Amount
STANDING APPROPRIATIONS—		
23-100 Mill Tax.....	2	\$285,792.71
School of Mines Support.....	40	9,500.00
Fruit Farm Investigation.....	84	2,000.00
ANNUAL APPROPRIATIONS—		
General Support.....	1	325,000.00
Sundry Special Support.....	18-20-23-28-31-34- 35-37-40-41-43-45- 49-51-52-55-57-58- 60-62-64-67-71-72- 73-74-79-81-83-87- 88-93-100-101-106- 115-116-123-125-131	379,850.00
ADVANCE ON MILL TAX.....	273	100,000.00
INTEREST ON INVESTMENTS—		
Swamp Land Interest.....	271	10,968.72
Federal Land Grant.....	272	57,328.44
FEDERAL APPROPRIATIONS.....	284	75,000.00
FEES AND TUITION.....	118-128-275-276	204,943.44
RENTS CAMPUS HOUSES.....	98	14,622.61
SALE OF FARM PRODUCTS.....	277-278-44-46-53- 56-59-63-65-69-76- 78-80-82-85-103-119- 124-129	69,776.74
UNIVERSITY MISCELLANEOUS		
RECEIPTS.....	279-285-19-21-24-29- 36-38-39-89	29,883.21
CANCELED BALANCES RESTORED BY STATE AUDITOR.....	42-47-66-68-77-94- 104-107-109-113	2,372.02
TRANSFERS.....	30-32-33-90-91-99- 102-120-121	48,825.58
DINING HALL, ETC.....	117-127-280-281-282- 283	135,616.64
CONTINGENT FUNDS RE- CREDITED.....	50-274	13,000.00
REFUNDS.....	25-287	260.72
		\$1,764,740.83

TABLE XIV

TRANSFERS AND ENTRIES OTHER THAN UNIVERSITY MAINTENANCE
EXPENDITURES CHARGED TO ACCOUNTS

	Item	Amount
Transferred from General Support to Fuel	4	\$42,171.27
Transferred from Elliot Hospital to Fuel.	26	3,049.06
Refund Salary.....	25	93.06
Advance on 23-100 mill tax during year Aug. 1, 1910 to July 31, 1911, charged to University Support and later a new advance made to replace.....	5	100,000.00
Refund of Fees and Breakage Deposit, University.....	6	20,633.96
Refund of Fees and Breakage Deposit, Agriculture.....	7	10,431.00
Crookston Support paid by University Support.....	8	751.01
Transferred from Support to University Extension.....	9	300.00
Overdraft year ending July 31, 1911, Agricultural Extension.....	61	1,976.41
Fire Loss Wabasha Street House.....	90	440.60
Fire Loss Boiler House.....	91	1,090.49
Transfer from Campus Rents to Repairs.	92	12.40
Transfer from Bookstore (Agriculture) to Repairs.....	102	664.40
Dining Hall Receipts, Crookston.....	117	14,330.64
Correctional Entry.....	120	346.35
Overdraft Crookston Support, July 31, 1911.....	122	309.46
Dining Hall Receipts, Morris.....	127	5,618.23
Overdraft Morris Support, July 31, 1911.	130	556.28
Contingent Funds charged Dairy Ex- tension by error.....	50	200.00
Contingent Funds charged to Support by error.....	3	12,800.00
Dental Infirmary.....	3	15,806.10
Sanford Hall Receipts.....	3	27,637.12
Shevlin Hall Receipts.....	3	11,695.06
Dining Hall Receipts, Agriculture.....	3	60,529.49
		<hr/>
		\$331,442.39
Refunds (Salary Checks Canceled)	3	167.66
Canceled by State Auditor	48-54-70-105- 108-110-112-114	409.87
		<hr/>
		\$332,019.92

TABLE XV

TRANSFERS AND ENTRIES OTHER THAN UNIVERSITY MAINTENANCE
RECEIPTS CREDITED TO ACCOUNTS

	Item	Amount
Transferred to Fuel Fund from General Support.....	32	\$42,171.27
Transferred to Fuel Fund from Elliot Hospital Support.....	33	3,049.06
Refund Salary.....	25	93.06
Advance on 23-100 mill tax during year Aug. 1, 1910 to July 31, 1911, charged to University Support and later a new advance made to replace.....	273	100,000.00
Refund of Fees and Breakage Deposit, University.....	6	20,633.96
Refund of Fees and Breakage Deposit, Agriculture.....	7	10,431.00
Transferred from University Support to Crookston Support.....	121	751.01
Transferred from Support to University Extension.....	30	300.00
Fire Loss Wabasha Street House.....	90	440.60
Fire Loss Boiler House.....	91	1,090.49
Transfer from Campus Rents to Repairs.	99	12.40
Transfer from Bookstore (Agriculture) to Repairs.....	102	664.40
Dining Hall Receipts, Crookston.....	117	14,330.64
Correctional Entry.....	120	346.35
Dining Hall Receipts, Morris.....	127	5,618.23
Contingent Funds Charged to Dairy Extension by error.....	50	200.00
Contingent Funds Charged to Support by error.....	275	12,800.00
Dental Infirmary.....	281	15,806.10
Sanford Hall Receipts.....	282	27,637.12
Shevlin Hall Receipts.....	283	11,695.06
Dining Hall Receipts, Agriculture.....	284	60,529.49
Refunds (Salary Checks Canceled)	287	167.66
Total.....		\$328,767.90

TABLE XVI

SUMMARY OF BUILDING AND EQUIPMENT FUNDS

	Balance Aug. 1, 1911	Credits to funds	Total	Debits to funds	Balance July 31, 1912
7. University Buildings.....	\$818,329.45	\$629,232.88	\$1,447,562.33	\$879,356.78	\$568,205.55
8. University Equipment.....	228,796.98	22,801.67	251,598.65	63,015.68	188,582.97
9. Agricultural Buildings.....	124,897.21	274,633.44	399,530.65	112,109.03	287,421.62
10. Agricultural Equipment.....	7,862.45	9,763.52	17,625.97	12,415.15	5,210.82
11. Crookston Buildings and Improve- ments.....	114.28	40,985.79	41,100.07	40,676.53	423.54
12. Grand Rapids Buildings and Im- provements.....	1,002.21	8,563.57	9,565.78	6,220.41	3,345.37
13. Morris Buildings and Improve- ments.....	386.06	100,322.00	100,708.06	83,522.34	17,185.72
14. Morris Equipment.....	.....	16,511.24	16,511.24	11,324.39	5,186.85
	<u>\$1,181,388.64</u>	<u>\$1,102,814.11</u>	<u>\$2,284,202.75</u>	<u>\$1,208,640.31</u>	<u>\$1,075,562.44</u>
Items other than expense charged to accounts, Table XVIII.....	.....	.....	.....	207,118.06	.....
	.....	.....	.....	<u>\$1,001,522.25</u>	.....
Agricultural Book-Store.....	.....	\$15,263.16	\$15,263.16	\$10,670.15	\$4,593.01

BUILDING FUND BALANCES

The large balance remaining in the building funds can be best explained by items:

(a) Heating Plant, balance of \$127,212.—Plans were completed in the early summer of 1911 and the contract awarded for the excavation and also the foundation, which was not completed until the spring of 1912. As the result of advertising for bids on the building, only one proposal was received. In response to the second advertisement there were a number of bids, but all were in excess of the money available, which necessitated reducing the size of the building and further delayed the awarding of the building contract. Difficulty was also experienced in awarding the contract for the tunnel piping within the appropriation, necessitating the revision of plans and readvertising. There remains now unappropriated approximately only \$2,400.

(b) Chemistry Building, balance of \$169,750.—The total amount appropriated is \$405,000,—\$230,000 available August 1, 1912. Tentative plans, on which the estimates were based, were made three years ago. With the completion of the plans and estimates it was found that the cost would approximate \$500,000. After the destruction of Millard Hall, a plan for combining the \$75,000 appropriated for fire-proofing, and the insurance with the Chemistry Building appropriation and constructing the Chemistry Building as originally planned was considered, but it developed that there was no law authorizing such a transfer. The plans have now been altered and the contract will soon be awarded.

(c) Alterations to Medical Science Building, balance of \$24,992.—The delay in completing the Medical Buildings prevented vacation of this building to allow operations.

(d) Fire-proofing Millard Hall, balance of \$121,898.—The building burned before plans were completed. The appropriation was \$75,000, which has been supplemented by the insurance. Contracts for the reconstruction have been awarded.

(e) Anatomy Building, balance of \$46,969.—This building is nearly completed. The balance represents estimates due and the 15 per cent withheld until the final acceptance is made. (Erection in charge of the State Board of Control.)

(f) General Medical Building, balance of \$61,583.—Note with reference to Anatomy Building applies.

(g) Mechanical Building and Equipment, Department of Agriculture, balance of \$221,330.—The erection is in charge of the State Board of Control. There was delay in making plans and awarding contracts.

(h) Medical Building Equipment, balance of \$58,384.—Purchase of equipment could not be made until New Millard Hall was ready for occupancy.

(i) Anatomy Building Equipment, balance of \$66,338.—Purchase could not be made until building was ready.

(j) Elliot Hospital Equipment balance of \$14,368.—Payment for

X-ray equipment withheld on account of defective operation, and other purchases delayed for various reasons.

(k) Dentistry Equipment, balance of \$19,711.—With the destruction of Old Millard Hall by fire, there was no place for equipment until the Medical Chemistry Building could be vacated and remodeled.

(l) Engineering Building Equipment, balance of \$18,639.—Purchase of the equipment has been delayed to reserve funds for payment of mechanical equipment of the building in the event there was not sufficient funds in the Campus Extension Tax Collections.

(m) Girls' Dormitory and Equipment, Morris, balance of \$13,325.—Erection in charge of State Board of Control. Building has recently been completed and equipment has been ordered.

TABLE XVII
CREDITS TO BUILDINGS AND EQUIPMENT FUNDS

	Item	Amount
Appropriations.....	132-136-137-138-156- 157-160-161-162-163- 168-164-165-166-167- 183-188-191-194-195- 198-199-200-202-204- 205-206-209-221-223- 225-227-229-231-232- 233-235-239-242-243- 244-246-247-248-250- 251-252-253-254-255- 256-257-258-259-260- 261-262-263	\$782,190.00
Campus Extension Levy.....	150	187,720.09
Sale of Certificates.....	151	64,945.83
Fire Loss.....	142-178	44,398.30
Miscellaneous Receipts.....	134-141-146-158-186- 190-207-245-265	3,375.04
Balances Restored by State		
Auditor.....	171-172-174-176-187- 189-192-196-211-213- 215-217-219-240	11,092.04
Contingent Fund Recredited.....	133	2,000.00
Transfers.....	145-148	7,092.81
		<hr/>
		\$1,102,814.11

TABLE XVIII
ITEMS CHARGED TO BUILDING AND EQUIPMENT FUNDS NOT
PROPERLY EXPENSE

	Item	Amount
Redemption of Campus Extension Certificates.....	152	\$200,000.00
Transfer from Elliot Hospital Equipment to Elliot Hospital Building Fund.....	145-182	1,462.50
Fire Loss.....	139-140	5,149.51
Balances Canceled by State		
Auditor.....	175-177-193-197-201- 203-208-210-212-214- 216-220-222-224-226- 228-230-234-237-241- 249	506.05
		<hr/>
		\$207,118.06

TABLE OF FUNDS SHOWING CREDITS, DEBITS, AND BALANCES
 NOTE.—Items in Received Column are appropriations unless otherwise designated.

TABLE XIX
 SUPPORT FUND

	Balance Aug. 1, 1911	Received	Total	Expended	Balance July 31, 1912
1. General Support.....	\$61,051.18	\$325,000.00			
2. 23-100 Mill Tax.....		285,792.71			
3. Miscellaneous Receipts per table XXXIV		623,877.15	\$1,295,721.04	\$984,216.94	
4. Transferred to Fuel Fund.....				42,171.27	
5. Transferred by State Auditor Advanced Tax Money.....				100,000.00	
6. Refund Fees and Breakage Deposit, University.....				20,633.96	
7. Refund Fees and Breakage Deposit, Agriculture.....				10,431.00	
8. Crookston Support Bills Paid.....				751.01	
9. Transferred to University Extension, Farm.....				300.00	\$86,199.45
Balances Transferred on New Ledger:					
10. *Hatch Fund Overdraft.....				716.64	
11. Morrill Fund.....					22,916.69
12. Nelson Fund.....					23,062.58
13. Adams Fund.....					1,321.50
14. Sanford Hall.....					1,000.00
15. Shevlin Hall.....					1,000.00
16. Dining Hall, Agriculture.....					1,000.00
	<u>\$61,051.18</u>	<u>\$1,234,669.86</u>	<u>\$1,295,721.04</u>	<u>\$1,159,220.82</u>	<u>\$136,500.22</u>
Government Remittance due July 1st, not received until after August 1st.					

TABLE XX
UNIVERSITY SPECIAL SUPPORT FUNDS

	Balance Aug. 1, 1911	Received	Total	Expended	Balance July 31, 1912
17. Periodicals.....	\$ 44.67	.....	\$ 44.67	\$ 44.67	.....
18. University Library.....	1,466.30	\$10,000.00	.....	.....	.....
19. Miscellaneous Receipts.....	.....	138.21	11,604.51	9,322.83	\$ 2,281.68
20. Law Library.....	5,000.00	5,000.00	.....	.....	.....
21. Miscellaneous Receipts.....	.....	176.00	10,176.00	9,281.24	894.76
22. Cataloguing Library.....	455.00	.....	455.00	455.00	.....
23. Elliot Hospital Support.....	11,948.17	79,600.00	.....	.....	.....
24. Miscellaneous Receipts.....	.....	1,392.60	.....	.....	.....
25. Refund Salary.....	.....	93.06	93,033.83	73,247.11	16,737.66
26. Transferred to Fuel Fund.....	.....	.....	.....	3,049.06	.....
27. College of Education.....	1,034.56	.....	.....	.....	.....
28. Economics Extension.....	978.39	10,000.00	.....	.....	.....
29. Miscellaneous Receipts.....	.....	2,626.10	.....	.....	.....
30. Transferred from Support Fees Incor- rectly Credited.....	.....	300.00	14,939.05	12,174.83	2,764.22
31. Fuel Fund.....	.....	20,000.00	.....	.....	.....
32. Transferred from Support.....	.....	42,171.27	.....	.....	.....
33. Transferred from Elliot Hospital Sup- port.....	.....	3,049.06	65,220.33	65,220.33	.....
34. Scientific Books and Instruments.....	.....	25,000.00	25,000.00	15,443.90	9,556.10
35. Research and Publication.....	.....	10,000.00	.....	.....	.....
36. Miscellaneous Receipts.....	.....	239.31	10,239.31	3,789.66	6,449.65

TABLE XX—Continued

	Balance Aug. 1, 1911	Received	Total	Expended	Balance July 31, 1912
37. Geological Survey.....		\$ 6,500.00			
38. Received from Geological and Natural History Survey.....		1,937.47			
39. Miscellaneous Receipts.....		329.90	\$ 8,767.37	\$ 2,516.88	\$6,250.49
40. Mines Support and Experiment Station.....		19,500.00	19,500.00	16,054.50	3,445.50
	\$20,927.09	\$238,052.98	\$258,980.07	\$210,600.01	\$48,380.06

TABLE XXI

*UNIVERSITY FARM SPECIAL SUPPORT FUNDS

	Balance Aug. 1, 1911	Received	Total	Expended	Balance July 31, 1912
41. Horticultural Crops.....	\$472.63	\$2,000.00			
42. Balance Restored by State Auditor.....		55.59	\$ 2,528.22	\$1,727.84	\$ 800.38
43. Field Crops.....	371.81	5,000.00			
44. Miscellaneous Receipts.....		4,125.97	9,497.78	5,775.57	3,722.21
45. Hog Cholera.....	837.04	4,000.00			
46. Miscellaneous Receipts.....		6,153.96			
47. Balance Grain Laboratory Restored by State Auditor.....		63.99	11,054.99	6,591.98	
48. Old Balance Canceled by State Auditor.....				17.46	4,445.55

TABLE XXI—Continued

	Balance Aug. 1, 1911	Received	Total	Expended	Balance July 31, 1912
49. Dairy Extension.....	\$ 12.02	\$ 3,000.00	.....	.....	.....
50. Contingent Fund Credited.....	.....	200.00	\$ 3,212.02	\$ 2,561.46	\$ 650.56
51. Injurious Insects.....	197.49	1,500.00	1,697.49	1,310.11	387.38
52. Forestry School and Experiment.....	1,936.49	11,500.00	.....	.....	.....
53. Miscellaneous Receipts.....	.....	51.55	13,488.04	10,627.97	.....
54. Canceled by State Auditor.....	.....	.....	.....	33.47	2,826.60
55. Plant Disease.....	99.64	1,500.00	.....	.....	.....
56. Miscellaneous Receipts.....	.....	319.80	1,919.44	1,415.59	503.85
57. Tobacco Culture.....	1,095.24	2,000.00	3,095.24	2,152.71	942.53
58. Eradication of Weeds.....	424.03	1,000.00	1,688.56	965.50	723.06
59. Miscellaneous Receipts.....	.....	264.53	.....	.....	.....
60. Agricultural Extension.....	.....	40,000.00	40,000.00	35,075.14	2,948.45
61. Overdraft, previous year.....	.....	.....	.....	1,976.41	.....
62. Poultry Department.....	23.67	5,000.00	.....	.....	.....
63. Miscellaneous Receipts.....	.....	236.46	5,260.13	1,656.29	3,603.84
64. Soil Inspection and Investigation.....	633.14	2,000.00	.....	.....	.....
65. Miscellaneous Receipts.....	.....	8.00	.....	.....	.....
66. Balance Restored.....	.....	106.75	2,747.89	2,681.87	66.02
67. Alcohol Plant.....	.....	2,000.00	.....	.....	.....
68. Old Balance Restored.....	.....	117.56	.....	.....	.....
69. Miscellaneous Receipts.....	.....	743.26	2,860.82	2,817.06	.....
70. Canceled by State Auditor.....	.....	.....	.....	43.76	.....
71. Farm Library.....	33.16	6,000.00	6,033.16	4,841.50	1,191.66

TABLE XXI—Continued

	Balance Aug. 1, 1911	Received	Total	Expended	Balance July 31, 1912
72. Drainage Problem.....	\$ 963.10	\$2,000.00	\$2,963.10	\$1,785.43	\$1,177.67
73. Agricultural Engineering Investigation.....		500.00	500.00	283.13	216.87
74. Field Work and Farm Management.....		1,500.00	1,500.00	1,369.95	130.05
75. Seeds and Experiment.....	710.78				
76. Miscellaneous Receipts.....		4.00	714.78	200.48	514.30
77. Military Instruction Balance Restored.....		529.94	551.10	453.55	97.55
78. Miscellaneous Receipts.....		21.16			
79. Board of Regents Timber Preservation.....	1,300.18	1,500.00			
80. Miscellaneous Receipts.....		60.00	2,860.18	956.79	1,903.39
81. Animal Nutrition.....		2,500.00			
82. Miscellaneous Receipts.....		2,074.80	4,574.80	2,167.11	2,407.69
83. Fruit Farm Investigation.....		2,500.00			
84. Fruit Farm Maintenance.....		2,000.00			
85. Miscellaneous Receipts.....		749.91	5,249.91	4,330.78	919.13
86. Forest Lands.....	542.25		542.25		542.25
87. Premiums.....		2,000.00	2,000.00	1,735.25	264.75
	<u>\$9,652.67</u>	<u>\$116,887.23</u>	<u>\$126,539.90</u>	<u>\$95,554.16</u>	<u>\$30,985.74</u>

TABLE XXII

UNIVERSITY REPAIR FUNDS

	Balance Aug. 1, 1911	Received	Total	Expended	Balance July 31, 1912
88. University Repairs.....	\$7,784.44	\$25,000.00	.....	.....	.....
89. Miscellaneous Receipts.....	.....	6,466.19	.....	.....	.....
90. Transferred from Wabasha Fire Loss .....	.....	440.60	.....	.....	.....
91. Transferred from Boiler House Fire Loss.....	.....	1,090.49	\$40,781.72	\$36,426.62	.....
92. Transferred to Campus Building Rents .....	.....	.....	.....	12.40	\$4,342.70
93. Folwell Hall Attic.....	.....	4,000.00	4,000.00	4,000.00	.....
94. Water Mains Balance Restored.....	.....	960.37	960.37	43.50	916.87
95. Medical Building Insurance.....	285.49	.....	285.49	67.06	218.43
96. Rents University Campus Buildings..	8,081.03	.....	.....	.....	.....
97. Transferred from University Campus Repairs.....	949.27	.....	.....	.....	.....
98. Miscellaneous Receipts.....	.....	14,622.61	.....	.....	.....
99. Transferred from University Repairs .....	.....	12.40	23,665.31	14,309.12	9,356.19
	<u>\$17,100.23</u>	<u>\$52,592.66</u>	<u>\$69,692.89</u>	<u>\$54,858.70</u>	<u>\$14,834.19</u>

TABLE XXIII

UNIVERSITY FARM REPAIR FUNDS

	Balance Aug. 1, 1911	Received	Total	Expended	Balance July 31, 1912
100. Farm Campus Repairs.....	\$93.78	\$ 2,500.00	\$ 2,593.78	\$1,683.57	\$ 910.21
101. Farm Repairs.....		10,000.00			
102. Transferred from Book Store.....		664.40			
103. Miscellaneous Receipts.....		1,555.37	12,219.77	9,323.97	2,895.80
104. Farm Sewers Balance Restored.....		147.85	147.85	145.92	
105. Canceled by State Auditor.....				1.93	
106. Dining Hall Repairs.....		5,000.00	5,000.00	4,983.90	16.10
107. Grading Larpentour Avenue, Balance Restored.....		51.75	51.75	2.63	
108. Balance Canceled by State Auditor.....				49.12	
109. Farm Greenhouse Repairs, Balance Restored.....		292.74	292.74	85.51	
110. Balance Canceled by State Auditor.....				207.23	
111. Home Building Repaired.....	11.42		11.42		
112. Canceled by State Auditor.....				11.42	
113. Itasca State Park Repairs, Balance Restored.....		45.48	45.48		
114. Balance Canceled by State Auditor..				45.48	
	<u>\$105.20</u>	<u>\$20,257.59</u>	<u>\$20,362.79</u>	<u>\$16,540.68</u>	<u>\$3,822.11</u>

TABLE XXIV

SUB-STATION SUPPORT FUNDS

	Balance Aug. 1, 1911	Received	Total	Expended	Balance July 31, 1911
115. Crookston School Support.....	\$210.85	\$20,000.00	.....	.....	.....
116. Station Appropriation.....		10,000.00	.....	.....	.....
117. Receipts from Dining Hall.....		14,330.64	.....	.....	.....
118. Fees.....		750.00	.....	.....	.....
119. Miscellaneous Receipts.....		8,839.92	.....	.....	.....
120. Correctional Entry.....		346.35	.....	.....	.....
121. Paid from University Support by State Auditor.....		751.01	\$55,228.77	\$53,131.46	.....
122. Overdraft Aug. 1, 1911, Crookston Station.....				309.46	\$1,787.85
123. Grand Rapids Support.....	136.23	7,000.00	.....	.....	.....
124. Miscellaneous Receipts.....		7,140.67	14,276.90	13,426.59	850.31
125. Morris Support.....		19,750.00	.....	.....	.....
126. Morris Farm Maintenance.....	105.09		.....	.....	.....
127. Dining Hall Receipts.....		5,618.23	.....	.....	.....
128. Fees.....		525.00	.....	.....	.....
129. Miscellaneous Receipts.....		5,728.69	31,727.01	30,438.51	.....
130. Overdraft, Aug. 1, 1911.....			.....	556.28	732.22
131. Home Economics.....		1,500.00	1,500.00	1,500.00	.....
	\$452.17	\$102,280.51	\$102,732.68	\$99,362.30	\$3,370.38

TABLE XXV

UNIVERSITY BUILDING FUNDS

	Balance Aug. 1, 1911	Received	Total	Expended	Balance July 31, 1912
132. Heating Plant.....	\$122,324.59	\$50,000.00	.....	.....	.....
133. Contingent Fund.....	.....	2,000.00	.....	.....	.....
134. Miscellaneous Receipts.....	.....	75.10	\$174,399.69	\$31,710.21	.....
135. Expended on Tunnel Construction... (\$17,915.06 previously expended on tunnel, total \$33,394.31)	.....	.....	.....	15,477.25	\$127,212.23
136. University Chemistry Building.....	.....	175,000.00	175,000.00	5,249.63	169,750.37
137. University Medical Science Building Alterations.....	.....	25,000.00	25,000.00	8.00	24,992.00
138. Fire-proofing Millard Hall.....	.....	75,000.00	.....	.....	.....
139. Transferred from Old Fire Loss....	5,331.41	.....	.....	838.13	.....
140. Transferred from Old Fire Loss Contents.....	4,558.62	.....	.....	4,311.38	.....
141. Miscellaneous Receipts.....	.....	202.10	.....	.....	.....
142. Recent Fire Loss.....	.....	41,955.58	127,047.71	.....	121,898.20
143. Anatomy Building.....	234,578.63	.....	234,578.63	187,609.37	46,969.26
144. Elliot Hospital Building.....	31,907.59	.....	.....	.....	.....
145. Transferred from Equipment.....	.....	1,462.50	.....	.....	.....
146. Miscellaneous Receipts.....	.....	241.37	33,611.46	33,095.88	515.58
147. General Medical Building.....	253,612.58	.....	253,612.58	192,029.07	61,583.51

TABLE XXV—Continued

	Balance Aug. 1, 1911	Received	Total	Expended	Balance July 31, 1912
148. *Elliot Hospital Site.....		\$ 5,630.31	\$ 5,630.31	\$ 264.09	\$5,366.22
149. Campus Extension.....	\$160,362.73				
150. Receipts from Tax Collections.....		187,720.09			
151. Sale of Certificates.....		64,945.83	413,028.65		
152. Certificates Redeemed.....				200,000.00	
153. Interest on Certificates.....				14,250.00	
154. Engineering Buildings.....				189,477.77	9,300.88
155. University Girls' Dormitory.....	5,653.30		5,653.30	5,036.00	617.30
	<u>\$818,329.45</u>	<u>\$629,232.88</u>	<u>\$1,447,562.33</u>	<u>\$879,356.78</u>	<u>\$568,205.55</u>

*The Elliot Hospital Site Fund was created by subscription and not previously carried on the University regular books. Since August 1st, 1911 the amount has been turned in to the State Treasurer and the two retaining walls previously charged to Campus Rents Fund will eventually be charged to this fund.

TABLE XXVI

UNIVERSITY FARM BUILDING FUNDS

	Balance Aug. 1, 1911	Received	Total	Expended	Balance July 31, 1912
156. Farm Girls' Dormitory.....		\$ 50,000.00	\$ 50,000.00	\$47,400.05	\$ 2,599.95
157. Farm Mechanical Building.....	\$98,800.00	160,000.00	.....	.....	.....
158. Contractor's Check Forfeited.....		152.82	258,952.82	36,632.59	.....
159. Temporary payment advanced, etc. Crookston Science Building to be reimbursed Aug. 1, 1912 .....			.....	989.50	221,330.73
160. Hog House.....		2,500.00	2,500.00	.....	2,500.00
161. Horse Barn.....		5,000.00	5,000.00	4,922.66	77.34
162. Electric Wiring.....		4,000.00	4,000.00	1,711.28	2,288 72
163. Heating Tunnels.....		3,000.00	3,000.00	40.50	2,959.50
164. Power House Repairs.....		14,700.00	14,700.00	154.00	14,546.00
165. Girls' Dormitory Basement		3,000.00	3,000.00	2,854.13	145.87
166. Remodeling Barn.....		5,000.00	5,000.00	.....	5,000.00
167. Water Mains.....	937.07	9,000.00	9,937.07	777.12	9,159.95
168. Drill Hall Alterations.....		10,000.00	10,000.00	.....	10,000.00
169. Dairy Hall.....	5,943.28	.....	5,943.28	1,737.83	4,205.45
170. Coal Bunkers.....	5,604.40	.....	5,604.40	2,008.28	3,596.12
171. Agricultural Lands, Balance Restored by Auditor.....		3,238.67	3,238.67	.....	3,238.67

TABLE XXVI—Continued

	Balance Aug. 1, 1911	Received	Total	Expended	Balance July 31, 1912
172. Board of Regents Land Balance Re- stored.....		\$2,917.97	\$ 2,917.97	.....	\$2,917.97
173. Dairy Pavilion.....	\$13,612.46	.....	13,612.46	\$10,757.11	2,855.35
174. Water Tower and Tank Balance Re- stored.....		940.04	940.04	857.72	.....
175. Balance Canceled.....		.....	.....	82.32	.....
176. Heating Plant and Hall Balance Re- stored.....		1,183.94	1,183.94	1,170.00	.....
177. Balance Canceled.....		.....	.....	13.94	.....
	<u>\$124,897.21</u>	<u>\$274,633.44</u>	<u>\$399,530.65</u>	<u>\$112,109.03</u>	<u>\$287,421.62</u>

TABLE XXVII

UNIVERSITY EQUIPMENT FUNDS

	Balance Aug. 1, 1911	Received	Total	Expended	Balance July 31, 1912
178. Fire Loss Laboratory Medical Science.		\$ 2,442.72	\$ 2,442.72	.....	\$ 2,442.72
179. University Medical Building Equip- ment.....	\$59,887.50	.....	59,887.50	\$ 1,503.04	58,384.46
180. Anatomy Building Equipment.....	67,200.00	.....	67,200.00	861.04	66,338.96
181. Elliot Hospital Equipment.....	42,354.15	.....	42,354.15	26,523.47	.....
182. Transferred to Building.....	.....	.....	.....	1,462.50	14,368.18
183. College of Dentistry Equipment.....	.....	20,000.00	20,000.00	289.00	19,711.00
184. Engineering Building Equipment.....	32,000.00	.....	32,000.00	13,360.85	18,639.15
185. Engineering Laboratory Equipment... ..	27,355.33	.....	.....	.....	.....
186. Miscellaneous Receipts.....	.....	59.00	27,414.33	18,821.58	8,592.75
187. Bacteriological Laboratory Equipment Balance Restored.....	.....	299.95	299.95	194.20	105.75
	<u>\$228,796.98</u>	<u>\$22,801.67</u>	<u>\$251,598.65</u>	<u>\$63,015.68</u>	<u>\$188,582.97</u>

TABLE XXVIII
UNIVERSITY FARM EQUIPMENT FUNDS

	Balance Aug. 1, 1911	Received	Total	Expended	Balance July 31, 1912
188. Live Stock	\$4,000.00	\$4,000.00	.....	.....	.....
189. Balance Restored.....		1,710.08	.....	.....	.....
190. Miscellaneous Receipts.....		1,957.13	\$11,667.21	\$8,607.94	\$3,059.27
191. Farm Girls' Dormitory Equipment....	3,862.45	2,000.00	5,862.45	3,710.90	2,151.55
192. Main Building Equipment Balance					
Restored.....		96.31	96.31	.....	.....
193. Canceled by Auditor.....		.....	.....	96.31	.....
	<u>\$7,862.45</u>	<u>\$9,763.52</u>	<u>\$17,625.97</u>	<u>\$12,415.15</u>	<u>\$5,210.82</u>

TABLE XXIX

NORTHWEST SCHOOL AND EXPERIMENT STATION, CROOKSTON

BUILDINGS AND IMPROVEMENTS

	Balance Aug. 1, 1911	Received	Total	Expended	Balance July 31, 1912
194. New Cottages.....		\$10,000.00	\$10,000.00	\$10,000.00	
195. Industrial Building.....		10,000.00			
196. Balance Restored.....		170.90	10,170.90	10,156.31	
197. Canceled by Auditor.....				14.59	
198. School Buildings.....		1,500.00	1,500.00	1,336.42	\$163.58
199. Superintendent's Dwelling.....		900.00	900.00	900.00	
200. Sidewalks and Curbing.....		1,500.00	1,500.00	1,496.57	
201. Canceled by Auditor.....				3.43	
202. Grading and Grounds.....		1,500.00	1,500.00	1,498.04	
203. Canceled by Auditor.....				1.96	
204. Spur Track.....		1,600.00	1,600.00	1,600.00	
205. Trees and Shrubbery.....		200.00	200.00	94.25	105.75
206. Water Works.....		1,000.00			
207. Miscellaneous Receipts.....		54.28	1,054.28	1,053.57	
208. Canceled by Auditor.....				.71	
209. Well and Pump.....		1,000.00	1,000.00	999.60	
210. Canceled by Auditor.....				.40	
211. Crookston Drainage Balance Restored.....		137.32	137.32	77.22	
212. Canceled by Auditor.....				60.10	

TABLE XXIX—Continued

	Balance Aug. 1, 1911	Received	Total	Expended	Balance July 31, 1912
213. School Building Equipment Balance					
Restored.....		\$ 221.16	\$ 221.16	\$ 59.05	
214. Canceled by Auditor.....				162.11	
215. Dormitory and Equipment Balance					
Restored.....		75.15	75.15	74.78	
216. Canceled by Auditor.....				.37	
217. Library and Drill Hall Balance Re- stored.....		13.94	13.94	13.38	
218. Canceled by Auditor.....				.56	
219. Root Cellar Balance Restored.....		23.04	23.04	23.00	
220. Canceled by Auditor.....				.04	
221. Dairy Barn.....		2,500.00	2,500.00	2,499.30	
222. Canceled by Auditor.....				.70	
223. Horse Barn.....		2,000.00	2,000.00	1,998.01	
224. Canceled by Auditor.....				1.99	
225. Sheep Fold.....		1,500.00	1,500.00	1,499.93	
226. Canceled by Auditor.....				.07	
227. Silo.....		500.00	500.00	499.44	
228. Canceled by Auditor.....				.56	
229. Poultry House.....		2,000.00	2,000.00	1,998.28	
230. Canceled by Auditor.....				1.72	
231. Farm House.....		1,500.00	1,500.00	1,439.33	\$60.67
232. Painting.....		350.00	350.00	296.00	54.00

TABLE XXIX—Continued

	Balance Aug. 1, 1911	Received	Total	Expended	Balance July 31, 1912
233. Fencing.....		\$540.00	\$540.00	\$539.99	.....
234. Canceled by Auditor.....			.....	.01	.....
235. Bridges.....		200.00	200.00	160.46	\$39.54
236. Slaughter House.....	\$114.28	.....	114.28	113.81	.....
237. Canceled by Auditor.....			.....	.47	.....
	<u>\$114.28</u>	<u>\$40,985.79</u>	<u>\$41,100.07</u>	<u>\$40,676.53</u>	<u>\$423.54</u>

TABLE XXX

NORTH CENTRAL EXPERIMENT STATION, GRAND RAPIDS

BUILDINGS AND IMPROVEMENTS

	Balance Aug. 1, 1911	Received	Total	Expended	Balance July 31, 1912
238. Drainage.....	\$1,002.21	.....	\$1,002.21	\$ 699.50	\$ 302.71
239. New Well.....		\$1,500.00	1,500.00	1,242.59	257.41
240. Dairy Building Balance Restored.....		63.57	63.57	.....	.....
241. Canceled by Auditor.....			.....	63.57	.....
242. Creamery Experiment, etc.....		3,000.00	3,000.00	214.75	2,785.25
243. Barn Silo.....		4,000.00	4,000.00	4,000.00	.....
	<u>\$1,002.21</u>	<u>\$8,563.57</u>	<u>\$9,565.78</u>	<u>\$6,220.41</u>	<u>\$3,345.37</u>

TABLE XXXI

WEST CENTRAL SCHOOL AND EXPERIMENT STATION, MORRIS

BUILDINGS AND IMPROVEMENTS

	Balance Aug. 1, 1911	Received	Total	Expended	Balance July 31, 1912
244. School Improvements.....	\$386.06	\$ 2,000.00	.....	.....	.....
245. Miscellaneous Receipts.....		122.00	\$ 2,508.06	\$ 1,770.75	\$ 737.31
246. Girls' Dormitory.....		50,000.00	50,000.00	36,674.40	13,325.60
247. Heating Plant.....		35,000.00	35,000.00	34,083.15	916.85
248. Horse Barn.....		2,000.00	2,000.00	1,999.88	.....
249. Canceled by Auditor.....		.....	.....	.12	.....
250. Machine Shed.....		1,000.00	1,000.00	1,000.00	.....
251. Hog, Sheep and Poultry Buildings.....		1,500.00	1,500.00	1,458.91	41.09
252. Cistern.....		1,500.00	1,500.00	1,500.00	.....
253. Cow Barn.....		700.00	700.00	268.97	431.03
254. Laundry Basement.....		400.00	400.00	363.56	36.44
255. Moving Cottages.....		1,000.00	1,000.00	1,000.00	.....
256. Hospital Repairs.....		100.00	100.00	28.84	71.16
257. Water, Light, and Sewer.....		3,000.00	3,000.00	2,935.75	64.25
258. Fencing.....		1,000.00	1,000.00	206.28	793.72
259. Drainage.....		1,000.00	1,000.00	231.73	768.27
	<u>\$386.06</u>	<u>\$100,322.00</u>	<u>\$100,708.06</u>	<u>\$83,522.34</u>	<u>\$17,185.72</u>

TABLE XXXII
NORTH CENTRAL SCHOOL AND EXPERIMENT STATION, MORRIS
EQUIPMENT

	Balance Aug. 1, 1911	Received	Total	Expended	Balance July 31, 1912
260. Equipment and Sidewalk.....		\$6,500.00	\$6,500.00	\$3,243.90	\$3,256.10
261. Building and Equipment.....		2,500.00	2,500.00	2,358.36	141.64
262. Machinery.....		500.00	500.00	500.00	
263. Horses.....		1,000.00	1,000.00	1,000.00	
264. Live Stock.....		1,500.00			
265. Miscellaneous Receipts.....		511.24	2,011.24	1,792.60	218.64
266. Dining Hall and Kitchen Equipment..		2,500.00	2,500.00	1,369.36	1,130.64
267. Library and Office Equipment.....		1,500.00	1,500.00	1,060.17	439.83
		<u>\$16,511.24</u>	<u>\$16,511.24</u>	<u>\$11,324.39</u>	<u>\$5,186.85</u>

TABLE XXXIII
UNCLASSED

	Balance Aug. 1, 1911	Received	Total	Expended	Balance July 31, 1912
268. Agricultural Book Store Transfer of Balance.....		\$ 2,944.98			
269. Miscellaneous Receipts.....		12,318.18	\$15,263.16	\$10,005.75	
270. Students' Reserve Fund, formerly credited to this fund by mistake; transferred to Repair Fund.....				\$664.40	\$4,593.01

TABLE XXXIV

RECEIPTS CREDITED TO UNIVERSITY SUPPORT FUNDS

271.	Interest on Principal Derived from Sale of Swamp Lands.....	\$ 10,968.72
272.	Interest on Investment, Land Grant of 1863.....	57,328.44
273.	Replacement of Advance of 23-100 Mill Tax made during last fiscal year and charged to Support Fund by State Auditor in August of 1911.....	100,000.00
274.	Contingent Fund Erroneously Charged to Support Fund, later Charged to Contingent Funds.....	12,800.00
275.	Students' Fees, University.....	184,380.86
276.	Fees, Department of Agriculture.....	19,287.58
277.	Miscellaneous Receipts, Agriculture.....	26,533.54
278.	Miscellaneous Receipts, Agricultural Experiment Station.....	5,165.15
279.	University Miscellaneous Receipts.....	16,376.70
280.	Dental Infirmary.....	15,806.10
281.	Fees, Sanford Hall.....	27,637.12
282.	Fees, Shevlin Hall.....	11,695.06
283.	Fees, Agriculture Dining Hall.....	60,529.49
284.	Received from Government.....	75,000.00
285.	Interest on Bank Deposits.....	200.73
287.	Refunds (Salary Checks Canceled).....	167.66
		<hr/>
		\$623,877.15

In closing, I wish to thank you, Mr. President, for your support and to express to the Faculty my appreciation of their co-operation.

Respectfully submitted,

G. H. HAYES, *Comptroller*

PUBLICATIONS OF THE FACULTIES, 1911-12

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