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The President's Report for the Year 1915-1916

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THE PRESIDENT'S REPORT FOR THE YEAR 1915-16

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, 1916. In reporting changes in the personnel of the teaching staff, I include only men and women of professorial rank.

Resignations.—During the year the following men of professorial rank resigned from the faculty: Charles E. van Barneveld, Professor of Mining Engineering; Alois F. Kovarik, Associate Professor of Physics; John T. E. Dinwoodie, Assistant Veterinarian; Horace P. Hoskins, Assistant Professor of Veterinary Medicine and Surgery; Francis C. Frary, Assistant Professor of Chemistry; Raymond A. Kent, Principal of the University High School and Assistant Professor of Education. Dr. Robert H. Mullin's acceptance of a position in another University was formally recognized by the Regents as a resignation from his Associate Professorship of Pathology and Bacteriology.

Death.—Dr. Abraham Barker Cates died June 10, 1915.

Leaves of absence granted during the year.—Dean Guy S. Ford for the second semester on half salary; Professor William H. Emmons to act as expert witness at Butte, Montana, for one month without salary; Professor Albert E. Jenks for six months from August 1, 1915, without salary, to engage in a study of racial amalgamation as manifested on the Indian reservations of Minnesota; Professor Elmer E. Stoll, for one year beginning August 1, 1916, without salary; Professor Jeremiah S. Young, for the academic year 1916-17, on half salary; Associate Professor James F. Corbett, during time of service as reserve officer in the United States Army, with salary; Assistant Professor Joseph Warren Beach, for the second semester of the academic year 1915-16 on account of ill-health, on full salary; Assistant Professor Frederick K. Butters, for one year beginning August 1, 1916, on half salary; Assistant Professor Daniel Ford, for the academic year 1916-17, on half salary; Assistant Professor Gerhard A. Gesell, for one year beginning May 26, 1916, without salary; Assistant Professor Edward M. Lehnerts, for one year

beginning August 1, 1916, at half salary; Assistant Professor Thomas W. Mitchell, for the academic year 1916-17, on half salary; Assistant Professor Hermon L. Slobin, on account of illness, with full salary; Assistant Professor Henry L. Ulrich from March 15, 1916, to May 31, 1916, without salary.

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

Carl Lotus Becker as Professor of History.

B.L., 1896, University of Wisconsin; Ph.D., 1907, University of Wisconsin; Instructor History, Pennsylvania State College, 1899-1901; Instructor History, Dartmouth, 1901-02; Assistant Professor University of Kansas, 1902-06; Associate Professor, 1906-08; Professor, University of Kansas, 1908-16.

Carleton Brown as Professor of English.

A.B., 1888, Carleton College; A.M., 1901, Ph.D., 1903, Harvard University; Instructor in English, Harvard University, 1903-05; Associate Professor of English, Bryn Mawr College, 1905-07; Associate Professor of English, Bryn Mawr, 1907-10; Professor of English Philology, Bryn Mawr College, 1910 to 1915-16.

Carl Warren Gay, Professor of Animal Husbandry, Chairman of the Animal Industry Group.

D.V.M., 1899, Cornell University; B.S.A., 1905, Iowa State College; Instructor in Veterinary Division, Iowa State College, 1901-02; Professor in Veterinary Division, Iowa State College, 1902; Assistant Professor of Animal Husbandry, Iowa State College, 1904; Assistant Professor of Animal Husbandry, Agricultural College, Ohio State University, March, 1905; Associate Professor of Animal Husbandry, Agricultural College, Ohio State University, 1906; Professor of Animal Industry, University of Pennsylvania, and Director of Horse Breeding, Department of Agriculture, Pennsylvania, July, 1907; also Director of the farm of the State Livestock Sanitary Board, April, 1911.

Henry Herbert Kildee, Professor of Dairy Husbandry.

B.S.A., 1908, Iowa State College; Instructor in Animal Husbandry, Iowa State College, January, 1909, to June, 1909; Experimentalist in Animal Husbandry, June, 1909, to September, 1910; Professor and Chief in Dairy Husbandry, Iowa State College, September, 1910 to 1915-16.

Leonard George Rowntree, Professor of Medicine and Chief of the Department of Medicine in the Medical School.

M.D., 1905, Western Medical School; Volunteer Assistant in Medicine, Johns Hopkins, 1907-08; Instructor, Assistant, and Associate Professor of Experimental Therapeutics, 1909-14, Johns Hopkins University; Associate Professor of Medicine, Johns Hopkins University, 1914.

Melvin E. Haggerty, Professor of Educational Psychology in the College of Education.

A.B., 1902, Indiana University; A.M., 1907, Indiana University; A.M., 1909, Harvard University; Ph.D., 1910, Harvard University; Graduate study, University of Chicago, 1904; Instructor in Psychology, Indiana University, 1909; Assistant Professor of Psychology, Indiana University, 1910; Associate Professor of Psychology, Indiana University, 1913 to 1915-16.

Dr. Donald Church Balfour, Associate Professor of Surgery in the Graduate School on the Mayo Foundation.

M.B., 1906, M.D., 1914, University of Toronto; Interne, Hamilton City Hospital, Hamilton, Ontario, 1906-07; Associate in Pathology, Mayo Clinic, Rochester, Minn., 1907-08; Clinical Assistant, Mayo Clinic, Rochester, Minn., 1909-10; Junior Surgeon, Mayo Clinic, Rochester, Minn., 1910-12; Attending Surgeon, Mayo Clinic, Rochester, Minn., 1912 to 1915-16.

Dr. James S. Gilfillan, Associate Professor of Medicine.

M.D., 1898, University of Minnesota; Graduate work, University of Pennsylvania; University of Minnesota, 1907; Vienna, 1907-08; Baltimore, 1908; Professor of Medicine, University of Minnesota, 1903-13.

Dr. Arthur Hawley Sanford, Associate Professor of Bacteriology in the Graduate School on the Mayo Foundation.

A.B., 1904, A.M., 1907, M.D., 1907, Northwestern University; Medical practice, Milwaukee, Wis., 1907-11; Mayo Clinic, Rochester, Minn., 1911—1915-16; Instructor Bacteriology, Marquette University, 1907-08; Assistant in Physiology, Marquette University, 1907-08; Associate Professor, Physiology, 1908-09; Professor Physiology, Marquette University, 1909-11.

Dr. Bror E. Dahlgren, Associate Professor in Theory and Practice of Dentistry.

D.M.D., 1901, University of Minnesota; Practice of Dentistry, New York City, 1904-09; Research work, American Museum Natural History, 1902-09; Research work, Field Museum Natural History, 1909-14; Research work with Pennsylvania Department of Public Health, 1914-15.

Rupert Clendon Lodge, Assistant Professor of Philosophy.

A.B., 1909, Oxford; M.A., Oxford, 1912; Junior Assistant Lecturer in Philosophy in the University of Manchester, 1910-11; Substitute for Professor of Philosophy, University of Manchester, 1913; Graduate study, University of Warburg, 1911, Berlin, 1913-14; Instructor Philosophy and Psychology, University of Minnesota, 1914-15; Lecturer in Philosophy, University of Alberta, 1915-16.

Joseph Peterson, Assistant Professor of Psychology.

S.B., 1905, University of Chicago; Ph.D., University of Chicago, 1907; Professor of Psychology, Brigham Young University, Provo, Utah, 1907-11; Head Department Psychology, University of Utah, 1911-15.

Wayne William Bissell, Assistant Professor in the Department of Experimental Surgery and Pathology.

B.S., 1908, University of Wisconsin; M.D., 1911, Rush Medical College; Interne, Cook County Hospital, 1911-13; Resident Pathologist, Cook County Hospital, 1913-16.

George B. Eusterman, Assistant Professor of Clinical Medicine in the Graduate School on the Mayo Foundation.

M.D., 1908, University of Minnesota; Mayo Clinic, Rochester, Minnesota, 1908 to 1915-16.

Edward C. Kendall, Assistant Professor of Biochemistry in the Graduate Medical School on the Mayo Foundation.

B.S., 1908, A.M., 1909, Ph.D., 1910, Columbia University; Research work, Parke, Davis & Co., Research Laboratory, 1910-11; St. Luke's Hospital, New York Research Laboratory, 1911-14; Mayo Clinic, Rochester, Minnesota, 1914 to 1915-16.

Archibald H. Logan, Assistant Professor of Clinical Medicine in the Graduate School on the Mayo Foundation.

M.D., 1907, University of Pennsylvania; Medical practice, Pittsburg, Pennsylvania, August, 1908, to January, 1910; Instructor, University of Pittsburg, Ward Class Medicine, 1908-09; Mayo Clinic, Rochester, Minnesota, 1910 to 1915-16.

Frank Charles Mann, Assistant Professor in the Department of Pathology.

A.B., 1911, M.D., 1913, A.M., 1914, Indiana University; Instructor Experimental Surgery, Indiana University, 1913-14; Director Experimental Surgical Laboratory, Mayo Clinic, 1914 to 1915-16.

Alexander B. Moore, Assistant Professor of Roentgenology in the Graduate School on the Mayo Foundation.

M.D., 1907, University of Virginia; University Hospital, Charlottesville, Va.; St. Joseph's Hospital, Tacoma, Washington; Practice at The Plains, Virginia, 1907-10; Mayo Clinic, Rochester, Minnesota, 1910 to 1915-16.

Robert D. Mussey, Assistant Professor of Clinical Medicine in the Graduate School on the Mayo Foundation.

M.D., 1908, University of Cincinnati; Interne, Cincinnati General Hospital, 1908-09; Receiving Physician, Cincinnati General Hospital, 1909-10; Mayo Clinic, Rochester, Minnesota, 1910 to 1915-16.

Gordon B. New, Assistant Professor of Rhinology, Laryngology and Stomatology in the Graduate School on the Mayo Foundation.

D.D.S., 1906, M.B., 1909, University of Toronto; Hamilton City Hospital, 1909-10; Mayo Clinic, Rochester, Minnesota, 1910 to 1915-16.

Samuel Robinson, Assistant Professor of Surgery in the Graduate Medical Faculty on the Mayo Foundation.

A.B., 1898, M.D., 1902, Harvard University; Graduate study, University of Marburg, Germany, 1909; surgical practice, Boston, Massachusetts, 1903-12; Surgeon to Out-patients, Massachusetts General Hospital, 1908-12; Surgeon to Harvard Clinic, 1911-12; Surgeon and Assistant Superintendent, Clifton Spring Sanitarium, 1912-14; Mayo Clinic, Rochester, Minnesota, 1915-16.

W. E. Sistrunk, Assistant Professor of Surgery in the Graduate School on the Mayo Foundation.

Ph.G., 1900, Alabama Polytechnic Institute; M.D., 1906, Tulane University; Interne, Charity Hospital, New Orleans, 1904-06; Assistant House Surgeon, New Orleans Sanitarium, 1907-09; General practice, New Orleans, 1906-09; General practice, Lake Charles, Louisiana, 1909-10; Mayo Clinic, Rochester, Minnesota, 1911 to 1915-16.

Franklin R. Wright, Assistant Professor in charge of the Division of Urology of the Medical School.

D.D.S., 1890, M.D., 1894, University of Minnesota; Graduate study in Vienna, 1900, 1902-03; Berlin, 1902 and 1906; Clinical Assistant, University of Minnesota, 1896; Instructor, University of Minnesota, 1903; Assistant Clinical Professor, University of Minnesota, 1909 to 1915-16.

Wilford S. Miller, Principal of the University High School with the rank of Assistant Professor in the College of Education.

A.B., 1910, Indiana University; A.M., 1911, Indiana University; Instructor in Educational Psychology, 1910-11; Assistant and Secretary, School of Education, University of Illinois, 1911 to 1915-16.

Pedro Henríquez Ureña, Professorial Lecturer in the Department of Romance Languages.

Bachiller en Ciencias y Letres, 1901, University of San Domingo; Abagado, National University of Mexico, 1913; Instructor, Superior Commercial School of Mexico City, 1911; Professor of Spanish Literature, National University of Mexico, 1912-14.

Dr. Arthur Sweeney, Professorial Lecturer in Medical Jurisprudence.

B.A., 1880, St. John's College, New York; M.D., 1886, Harvard Medical School; Professor of Medical Jurisprudence, 1897-1913, University of Minnesota.

Promotions.—Cephas D. Allin from Associate Professor to Professor; Coates P. Bull from Associate Professor to Professor; Arthur S. Hamilton from Associate Professor to Professor; Julius P. Sedgwick from Associate Professor to Professor;

S. Marx White from Associate Professor to Professor; Fred L. Adair from Assistant Professor to Associate Professor; Albert C. Arny from Assistant Professor to Associate Professor; Gustav Bachman from Assistant Professor to Associate Professor; Oscar W. Firkins from Assistant Professor to Associate Professor; Arthur T. Mann from Assistant Professor to Associate Professor; Walter R. Ramsey from Assistant Professor to Associate Professor; John T. Rogers from Assistant Professor to Associate Professor; John L. Rothrock from Assistant Professor to Associate Professor; Elvin C. Stakman from Assistant Professor to Associate Professor; Moses Barron from Instructor to Assistant Professor; Frank S. Bissell from Instructor to Assistant Professor; Donald Ferguson from Instructor to Assistant Professor; Haldor B. Gislason from Instructor to Assistant Professor; Ernest M. Hammes from Instructor to Assistant Professor; Paul E. Miller from Instructor to Assistant Professor; Angus W. Morrison from Instructor to Assistant Professor; Horace Newhart from Instructor to Assistant Professor; Oscar Owre from Instructor to Assistant Professor; Francis W. Peck from Instructor to Assistant Professor; Ruth S. Phelps from Instructor to Assistant Professor; Charles E. Skinner from Instructor to Assistant Professor; Arthur C. Strachauer from Instructor to Assistant Professor; Henry L. Ulrich from Instructor to Assistant Professor; Helen A. Whitney from Instructor to Assistant Professor.

ADMINISTRATIVE CHANGES

Policy concerning agricultural organization.—In order to avoid misinterpretations of the attitude of the University toward farmers' organizations and toward coöperative enterprises, the Board has authorized the publication of a bulletin in which the general policy of the institution is clearly set forth. The pamphlet indicates that the University approves or encourages the organization of farmers' clubs, farm bureaus, and development associations, livestock and cow-testing associations, coöperative marketing organizations, coöperative creameries, laundries, and credit associations. Toward coöperative stores the policy is conservative and under almost all conditions advice is against these

enterprises. Coöperative buying is favored but it is advocated that this be done normally through a local merchant and not independently. The attempt of the University is not to set the farmers over against the townsmen but to develop a community feeling which shall include both. Copies of the pamphlet referred to above may be had on application to the Extension Division, Department of Agriculture, University Farm, St. Paul.

Policy concerning ore tests.—The University receives many requests from individuals and corporations to make tests of ores. This work is not only of value to those immediately concerned but has research and educational possibilities of importance to the School of Mines. The Board therefore approved the following conditions under which tests of ores may be undertaken by the Experiment Station: (a) that the regular Experiment Station service and power be furnished free; (b) that all extra labor and power costs be paid by the individuals or companies for whom the tests are made; (c) that the costs of all additional machinery and installation are also to be paid by those for whom the tests are made; (d) that all such additional machinery so installed shall become the property of the School of Mines.

Expert service in criminal cases.—From time to time requests are made that University professors make chemical and other analyses in connection with criminal cases. In accordance with the general University policy it is the desire of the Regents to avoid interference with the routine commercial practice of the different professions. At the same time the Board desires to coöperate with the authorities in the prosecution of their official duty. It has been decided, therefore, that the University will approve the making of analyses by University professors when these analyses have a bearing on criminal cases, provided such service be requested by a County Attorney and that the request be approved by the Attorney General.

Use of University name.—One or two business enterprises have, through technically legal devices, used the name of the University in exploiting commercial commodities. The Regents have voted to instruct the President to communicate with such business enterprises, and to request officially the discontinuance of allusion to the University of Minnesota. The rules of the Board forbid members of the faculty to permit the use of their names

in connection with commercial publicity. The Board has, of course, no authority over persons formerly connected with the University staff who continue to exploit that connection as an historical fact. The Regents, however, vigorously protest against attempts to use the prestige of the University to further the sale of articles of commerce.

Special provision for state and municipal officers.—By action of the Board, state and municipal officers who desire to take courses in the University which have a bearing on their technical work are to be exempt from the payment of any fees beyond the actual cost of materials that may be consumed. It was the conviction of the Board that the University ought in this way to be ready to coöperate with public officers who desire by special work to increase their efficiency.

EDUCATIONAL POLICIES

The Summer Session.—For a number of years the University maintained a summer session on the basis of offering chiefly elementary courses conducted by overloaded and underpaid instructors. There was no appropriation for this work, which was comparatively compelled to be self-supporting. The enrollment was small. Of these a good many were undergraduates who were making up deficiencies in the scholastic work of the regular year. In these circumstances the summer session could be little else than a coaching school for persons satisfied with more or less routine work in introductory studies. Minnesota teachers who desired to pursue advanced courses were compelled to resort to summer sessions in other states. For the last three years a new policy has been adopted with encouraging results. Advanced courses have been offered, the amount of teaching required of instructors has been reduced, and better salaries have been paid. The number of students has steadily increased, the interest has deepened and the evidence seems to indicate that under proper conditions there is no reason why Minnesota should not have one of the most successful summer sessions in the country. Only a beginning has been made, however. The report of the Director (see pp. 132-140) calls attention to serious problems of organization and administration which must receive early attention.

Progress of the Medical School.—The system of graduate fellowships known as teaching fellowships has demonstrated its value. It is expected that the original number of five will be increased to eight or ten. The Divisions of Pediatrics, and of Eye, Ear, Nose, and Throat have been recognized as administrative departments coördinating with the other departments of the Medical School. Access to the State Hospital for Crippled and Deformed Children in St. Paul has increased the available clinical opportunities. For the year 1916-17 the number of the first-year medical students has been limited to eighty. A system of careful tests will be applied to candidates with a view to selecting the eighty who show the greatest promise of profiting by a medical course.

Instruction in Journalism.—A beginning has been made in offering technical training to students who are planning to make newspaper work a career. Several courses under the charge of an experienced journalist, assisted by a graduate of a leading School of Journalism, have been offered, one of them for a year in coöperation with the student Daily, which provides laboratory facilities. A weekly journal has now been started largely to afford practice to students. The Regents have authorized the equipment of a printing establishment which will in time serve the double purpose of a University printing shop and a laboratory for the work in Journalism.

Four-year course in Business Training.—With the opening of the autumn semester of 1915 there was inaugurated in the College of Science, Literature, and the Arts a regular four-year course designed to afford special training in commerce and business administration. The curriculum includes in addition to courses in English, Spanish, French, and German, fundamental studies in commercial geography, industrial history, economics, business law, accounting, etc. These subjects will constitute the work of the first two years. In the last two years students will be given an opportunity to specialize in one of a number of different fields, such as transportation, banking, insurance, business administration.

The Animal Industry Group.—All the divisions and sections bearing upon Animal Husbandry, including the work in Veterinary Medicine have been brought together in one group under

the chairmanship of Dr. Carl W. Gay. This plan has met with the approval of experts in the various fields. The development of the idea will be watched with interest.

Problems of the Curriculum, etc.—Questions concerning the relation of the high-school curriculum to the work of the colleges; problems of high-school and college records; the pressing question of overcrowding in the Arts College; the possibilities of the Junior College Plan, are discussed in detail in the *Nineteenth Biennial Report* of the Regents (pp. 69-72).

Reorganization of the Military Department.—Since 1915 all first- and second-year students of all colleges have been required to join the cadet corps. Under the Act of Congress passed in June, 1916, an entirely new system went into effect. This calls for an increased number of commissioned and non-commissioned officers, for the furnishing, without charge, of uniforms and equipment, etc. Under this Act a definite career is open for students who wish to become candidates for the Reserve Officers' Corps. During junior and senior years an annual stipend of $108 will be available for candidates, who at graduation will be given six months training in the regular army with the pay and rank of second lieutenant.

Requirement of practical experience.—The policy of supplementing the work of the classroom with actual experience in dealing with professional and other vocational problems is being extended. This principle now applies in Medicine, Dentistry, Mining, Engineering, Law, and Architecture. The College of Agriculture has recently voted to require a minimum of genuine farm work as a condition of graduation.

Possible reorganization of teaching and administration.—The complexities involved in exchange of instruction between the various units of the University have raised the whole question of educational organization. The problem is discussed at some length in the *Nineteenth Biennial Report* (p. 74).

Unification of teacher training.—In June, 1916, the Board of Regents voted that teacher training is a function of the University as a whole and not of any one college or department. It was decided to unify under the College of Education all the teacher-training activities of the University, and to charge this college with the duty of certifying to the attainments and pro-

ficiency of candidates for the teaching profession. A complete statement of the final action will be found on pages 75-77 of the *Nineteenth Biennial Report.*

Coöperation with the General Education Board.—The Regents voted to accept the offer of the General Education Board of New York to pay the University $2,500 a year to provide teaching and administrative assistance for Dean L. D. Coffman who is to be permitted to make in behalf of the General Education Board a special study of the training of rural teachers in the Normal Departments of Minnesota high schools. It is a part of the understanding that all expenses of travel, stenographic and clerical assistance, etc., will be borne by the General Education Board.

Vocational conferences.—In the Arts College attention has been given to the problem of vocational guidance for undergraduates. There is a tendency of students to drift into the better-known, traditional professions and occupations without having attention called to the newer careers which have been developing so rapidly in recent years. In the winter of 1915 a series of vocational conferences was held for women students. Plans have been made for a course of addresses to freshmen on the choice of a profession, and on the various types of activity and service open to college-trained men and women. A committee of the faculty is at work upon a plan for grouping and supplementing existing courses in such a way as to give them increased vocational value.

THE STUDENTS

Student expenses and earnings.—As a result of a careful inquiry made in May, 1916, the following facts were disclosed as to the student expenses and earnings: average total expenses of students who live away from home, $487; actual expenses vary from $250 to $750; sixty per cent of all students are engaged in some form of gainful occupation. The average earnings of these students is $167 per annum. The total amount earned by students is estimated at $325,000. Full details with regard to expenditures and earnings will be found on pages 49-52 of the *Nineteenth Biennial Report.*

Free and service scholarships.—In order to assist deserving and self-supporting students the Regents voted to set aside from the Ludden Fund Bequest $2,000 with which to create one hundred free semester scholarships of the value of $20 each, and to make these available for the year 1916-17, and regularly thereafter, for students in the Colleges of Science, Literature, and the Arts, of Agriculture, of Education, and of Engineering. At the same time fifty service scholarships of the same amount each, namely $20, were established, to be sustained by support funds and to require from holders equivalent service in the laboratories, offices, etc., of the University. Through the lease of property, a part of the bequest of the late Mr. John D. Ludden, $3,000 annually has been added to the sum available for loans to students. The total annual amount of all loan funds is now approximately $15,000.

Supervision of boarding houses.—The Board has voted heartily to approve the policy administered by the Dean of Women with respect to houses in which women students of the University are received as boarders. The policy includes: (1) the segregation of men and women students of the University, (2) the provision of proper facilities for receiving callers; (3) a reasonable standard of sanitary safety which includes not only plumbing, heating, ventilation, but a good standard of cleanliness and care in housekeeping, and (4) a satisfactory social environment. During the spring and summer of 1916 the houses which receive men students were carefully inspected by persons specially employed for the purpose. A card catalog has been prepared which gives details of all kinds concerning each individual establishment.

Student self-government.—This form of social control is making steady progress. The various Councils and Associations have shown an increasing sense of responsibility. All questions which involve student offenses against the University community are referred to these bodies for investigation and report. Student finances have been carefully supervised by the Senate Committee on Finances and Audit. During the past two years there has been a decided decrease in the number of complaints with regard to the failure of student organizations to meet their obligations promptly.

STATISTICS OF REGISTRATION

Enrollment.—Table I shows the comparative registration figures for students of collegiate grade covering the years 1914-15 and 1915-16. The group includes only those departments in which high-school graduation is a prerequisite to admission. The total of this group is the figure used in comparing Minnesota with other colleges and universities. The total gain of 973 represents an increase of 20 per cent over last year. The largest

TABLE I. COLLEGIATE STUDENTS BY SCHOOLS AND COLLEGES, 1914-1916

College or School	Year 1914-15			Year 1915-16			Gain	Loss
	Men	Women	Total	Men	Women	Total		
Science, Literature, and the Arts:								
Seniors	73	174	247	81	191	272	25	
Juniors	123	182	305	148	213	361	56	
Sophomores	234	208	442	310	246	556	114	
Freshmen	398	304	702	496	384	880	178	
Unclassed	36	86	122	54	226	280	158	
Total	864	954	1818	1089	1260	2349	531	
Engineering and Architecture:								
Post-Seniors	35		35	28		28		7
Seniors	58		58	67		67	9	
Juniors	72		72	65		65		7
Sophomores	98		98	144		144	46	
Freshmen	193	1	194	201	2	203	2	
Irregular	16	2	18	16	3	19	1	
Total	472	3	475	521	5	526	51	
Agriculture:								
Seniors	55	42	97	74	50	124		
Juniors	67	50	117	91	72	163		
Sophomores	109	69	178	114	82	196		
Freshmen	160	89	249	129	91	220		
Unclassed	12	23	35	12	17	29		
Total	403	273	676	420	312	732	56	
Law:								
Third-Year	52		52	33		33		
Second-Year	44		44	41		41		
First-Year	74		74	74		74		
Unclassed				1		1		
Academic seniors taking law	7		7	22		22		
Total	177		177	171		171		6
Medical:								
Sixth-Year	35	1	36	35	1	36		
Fifth-Year	35	1	36	46	2	48		
Fourth-Year	58	2	60	71	2	73		
Third-Year	72	3	75	88	2	90		
Unclassed	14	1	15	22		22		
Total	214	8	222	262	7	269	47	
School for Nurses		53	53		63	63	10	

TABLE I—*Continued*

COLLEGIATE STUDENTS BY COLLEGES AND SCHOOLS, 1914-1916

College or School	Year 1914-15			Year 1915-16			Gain	Loss
	Men	Women	Total	Men	Women	Total		
Dentistry:								
Seniors	72	.....	72	86	1	87		
Juniors	86	1	87	94	4	98		
Sophomores	....	.....	.....	96	.....	96		
Freshmen	98	5	103	92	.....	92		
Irregular	3	1	4	2	.....	2		
Total	259	7	266	370	5	375	109	.....
Pharmacy:								
Graduates	1	.....	1	2	.....	2		
Seniors	27	6	33	32	5	37		
Juniors	60	7	67	56	7	63		
Freshmen	....	.....	.....	2	1	3		
Total	88	13	101	92	13	105	4	.....
Mines:								
Seniors	16	.....	16	11	.....	11		
Juniors	13	.....	13	16	.....	16		
Sophomores	20	.....	20	28	.....	28		
Freshmen	31	.....	31	17	.....	17		
First-Year	9	.....	9	7	.....	7		
Special Students	1	.....	1	1	.....	1		
Total	90	.....	90	80	.....	80	.....	10
Analytical and Applied Chemistry:								
Post-Seniors	3	.....	3	....	.....	.....		
Seniors	5	.....	5	11	.....	11		
Juniors	6	.....	6	14	1	15		
Sophomores	20	.....	20	9	1	10		
Freshmen	12	.....	12	20	2	22		
Irregular	6	.....	6	8	.....	8		
Total	52	.....	52	62	4	66	14	.....
Education:								
Seniors	16	27	43	20	21	41		
Juniors	18	15	33	19	15	34		
Unclassed	3	30	33	7	27	34		
Total	37	72	109	46	63	109		
Graduate	147	75	222	237	98	335	113	.....
Summer Session:								
College Sections	372	340	712	511	490	1001		
Agricultural	113	41	154	87	52	139		
Total	485	381	866	598	542	1140	274	.....
General Totals	3288	1839	5127	3948	2372	6320	1193	.....
Less duplicates	266	109	375	401	194	595	.....	220
Grand Total—Net	3022	1730	4752	3547	2178	5725	973	.....

student gain appears in the College of Science, Literature, and the Arts, which shows an increase of 531, the greatest advance as usual falling in the freshman group. The greatest percentage gain in this college is shown in unclassed students, the increase being 130 per cent. This is principally due to the registration of

a large number of city teachers, many of whom are taking advantage of the exchange free scholarship plan to get one or two college subjects a semester. Increases are registered in the colleges of Arts, Engineering, Agriculture, Medicine, Nurses, Dentistry, Pharmacy, Chemistry, Graduate School, and Summer Session. Slight decreases appear only in Law and Mines. The large increase in Dentistry is explained by the expansion of the course to four years, giving for the year 1915-16 two beginning classes, the last freshman registration in the three-year course and the first freshman registration in the four-year course.

The gain in Chemistry, while numerically small, represents a

TABLE II. SUBCOLLEGIATE STUDENTS, 1914-1916

School	Year 1914-15			Year 1915-16			Gain	Loss
	Men	Women	Total	Men	Women	Total		
Central School of Agriculture:								
Intermediate year	14	13	27	....	.....	.....	.....	27
Senior year	102	65	167	99	62	161	.....	6
Junior year	191	87	278	165	67	232	.....	46
Freshman year	284	109	393	293	73	366	.....	27
Special students	6	4	10	3	.....	3	.....	7
Normal Course	....	.....	.....	....	19	19	19	.....
Total	597	278	875	560	221	781	.....	94
Northwest School of Agriculture, Crookston:								
Regular Students	124	55	179	157	50	207	28	.....
West Central School of Agriculture, Morris:								
Regular Students	76	57	133	70	45	115	.....	18
Totals, Schools	797	390	1187	787	316	1103	.....	84
Short Courses:								
Traction Engineering	20	.....	20	23	.....	23	3	.....
Dairy School	113	1	114	96	.....	96	.....	18
Rural Life Conference	....	.....	.....	34	4	38	38	.....
Graduate Veterinarians	....	.....	.....	26	.....	26	26	.....
Teachers' Training School:								
Central	89	941	1030	124	990	1114	84	.....
Crookston	5	140	145	14	207	221	76	.....
Morris	9	155	164	9	159	168	4	.....
Farmers' Short Course:								
Central	540	87	627	969	282	1251	624	.....
Crookston	1412	406	1818	477	25	502	.....	1316
Morris	....	.....	.....	72	1	73	73	.....
Junior Short Course:								
Central	279	124	403	344	145	489	86	.....
Crookston	24	22	46	49	31	80	34	.....
Morris	....	.....	.....	36	8	44	44	.....
Mothers' Week, Morris	....	.....	.....	....	6	6	6	.....
Short Course for Embalmers	50	4	54	52	3	55	1	.....
Total, Short Courses	2541	1880	4421	2325	1861	4186	.....	235
Grand Total, (less duplicates)	3336	2270	5606	3081	2176	5257	.....	349

27 per cent advance and is prophetic of an increasing demand for industrial chemists.

The increase in the Graduate School registration has been augmented by the enrollment of sixty Fellows working under the Mayo Foundation plan.

Table II shows the registration of students in those departments which do not require at least high-school graduation for entrance. The net loss of 84 in the three schools of Agriculture has no special significance. The apparent loss of 1,316 short course students at Crookston is explained by the omission of registration in the farmers' convention this year, whereas the enrollment was taken for 1914-15.

Table III shows two groups of Extension Division students: (1) general, including those taking class work either in evening instruction at the University and in the Twin Cities, and the Short Course students who spend one to three weeks in continuous work; (2) correspondence study students. The loss in Group I is undoubtedly due to the reduced appropriations for extension work which resulted in the loss of Professor Nystrom, who had charge of the retail-selling classes.

TABLE III. EXTENSION STUDENTS, 1914-1916

Courses	Year 1914-15			Year 1915-16			Gain	Loss
	Men	Women	Total	Men	Women	Total		
General	1768	1009	2777	1180	909	2089	.....	688
Correspondence	50	67	117	136	72	208	91	.....
Total	1818	1076	2894	1316	981	2297	.....	597

TABLE IV. SUMMARY, 1914-1916

Division	Year 1914-15			Year 1915-16			Gain	Loss
	Men	Women	Total	Men	Women	Total		
Collegiate students	3022	1730	4752	3547	2178	5725	973	.....
Subcollegiate students	3336	2270	5606	3081	2176	5257	.....	349
Extension students	1818	1076	2894	1316	981	2297	.....	597
Grand Total	8176	5076	13252	7944	5335	13279	27	.....

Table IV gives a brief registration summary for the entire institution except the University High School. In giving the total enrollment of the University, care should be taken to differentiate these three groups. In comparing Minnesota with other universities and colleges the first group (collegiate students) should be used. If the registration of 102 in the University High School be added, the total rises to 13,381.

TABLE V. COMPARATIVE REGISTRATION FIGURES, 1914-1916

College	1914-15			1915-16			Gain		Loss	
	Men	Women	Total	Men	Women	Total	Men	Women	Men	Women
Science, Literature, and the Arts...	864	954	1818	1089	1260	2349	225	306	....	.....
Engineering and Architecture ...	472	3	475	521	5	526	49	2	....	.....
Agriculture	3776	2577	6353	3504	2527	6031	....	.....	272	50
Law	177	.....	177	171	.....	171	....	.....	6	.....
Medical (including nurses and embalmers)	296	67	363	346	73	419	50	6	....	.....
Dentistry	265	9	274	375	5	380	110	.....	....	4
Mines	90	.....	90	80	.....	80	....	.....	10	.....
Pharmacy	88	13	101	92	13	105	4	.....	....	.....
Chemistry	52	.....	52	62	4	66	10	4	....	.....
Education	37	72	109	46	63	109	9	.....	....	9
Graduate	147	75	222	237	98	335	90	23	....	.....
Summer Session (net)	135	240	375	177	338	515	42	98	....	.....
Total	6399	4010	10409	6700	4386	11086	301	376	....	.....
Less duplicates...	41	10	51	72	32	104	....	.....	31	22
Net Total....	6358	4000	10358	6628	4354	10982	270	354	....	.....
EXTENSION:										
General	1537	1002	2539	1044	907	1951	....	.....	493	95
Correspondence ..	50	67	117	136	72	208	86	5	....	.....
Merchants' Short Course	231	7	238	136	2	138	....	.....	95	5
Total	1818	1076	2894	1316	981	2297	....	.....	502	95
SUMMARY:										
Total, resident students	6358	4000	10358	6628	4354	10982	270	354	....	.....
Total, extension students	1818	1076	2894	1316	981	2297	....	.....	502	95
GRAND TOTALS	8176	5076	13252	7944	5335	13279	....	259	232	.....

Table V is a recapitulation of tables I, II, III, and IV.

Table VI enumerates the preparatory schools from which students entering the freshman classes of the respective colleges were received during the year 1915-16, also for the Minnesota group those schools which sent no students this year. Of the 248 approved high schools, 178 sent students. Seventy were not represented. Of the 53 that sent no matriculants last year, 33 were represented this year. The largest number from any school

outside of St. Paul, Minneapolis, and Duluth, is 16, representing Mankato. Two sent 10, two 9, three 8, three 7, six 6, six 5, fourteen 4, thirty-four 3, forty-six 2, and fifty-nine 1. Twenty-five private schools and the University High School were represented. One sent 11, two 10, two 9, one 8, one 7, one 6, one 5, one 4, one 3, seven 2, and seven 1. Twenty-two states are represented this year in the freshman class. Wisconsin, Iowa, South Dakota, North Dakota, and Illinois in the order given lead in our non-resident representation. Compared with last year, the Dakotas change places. Nine states represented last year sent none this year. Five states not represented last year sent students this year. Of the foreign countries only three were represented this year. Canada sent 3, Russia 3, and Norway 1. Six countries sent students last year.

TABLE VI. SCHOOLS FROM WHICH ENTRANTS WERE RECEIVED
1915-1916

	Science, Literature, and the Arts	Engineering	Chemistry	Mines	Dentistry	Pharmacy	Nurses	Special Law	Agriculture	Total
MINNESOTA										
Ada	1	....	....	....	....	....	1	....	....	2
Adrian	.....	1	....	....	....	....	....	....	1	2
Aitkin	.....	....	....	....	....	....	....	....	....	....
Akeley	2	....	....	....	1	....	....	....	1	4
Albert Lea	3	....	....	....	1	....	....	....	1	5
Alden	.....	....	....	....	....	....	....	....	....	....
Alexandria	2	1	....	....	....	....	....	....	2	5
Amboy	.....	....	....	....	....	....	....	....	....	....
Annandale	.....	....	....	....	....	....	....	....	....	....
Anoka	2	1	....	....	....	....	....	....	1	4
Appleton	.....	1	....	....	....	....	....	....	1	2
Argyle	.....	....	....	....	....	....	....	....	....	....
Arlington	.....	....	....	....	....	....	....	....	....	....
Atwater	.....	....	....	....	....	....	....	....	....	....
Aurora	.....	1	....	....	....	....	....	....	....	1
Austin	5	....	....	....	1	....	....	....	....	6
Bagley	.....	....	....	....	....	....	....	....	....	....
Baudette	1	....	....	....	....	....	....	....	....	1
Barnesville	1	....	....	....	....	....	....	....	....	1
Battle Lake	.....	....	....	....	....	....	....	....	....	....
Beardsley	.....	....	....	....	....	....	....	....	....	....
Belle Plaine	1	....	....	....	1	....	....	....	....	2
Bemidji	1	1	....	....	....	....	....	1	1	4
Benson	2	1	....	....	1	....	....	....	....	4
Bird Island	1	....	....	....	....	....	....	....	1	2
Biwabik	.....	....	....	....	....	....	....	....	....	....
Black Duck	.....	....	....	....	1	....	....	....	....	1
Blooming Prairie	1	1	....	....	....	....	....	....	1	3
Blue Earth	2	....	....	....	....	....	....	....	....	2
Brainerd	3	1	1	....	1	....	....	....	....	6
Breckenridge	4	....	....	....	1	....	....	....	....	5
Brown Valley	.....	....	....	....	....	....	....	....	....	....
Buffalo	5	....	....	....	....	....	....	....	1	6
Buhl	.....	....	....	....	....	....	....	....	....	....
Caledonia	.....	....	....	....	....	....	....	....	....	....
Cambridge	.....	....	....	....	3	....	....	....	....	3

TABLE VI—*Continued*

SCHOOLS FROM WHICH ENTRANTS WERE RECEIVED, 1915-16

	Science, Literature, and the Arts	Engineering	Chemistry	Mines	Dentistry	Pharmacy	Nurses	Special Law	Agriculture	Total
Canby	....	1	....	....	....	2	....	....	....	3
Cannon Falls	....	2	....	....	1	....	....	....	....	3
Carleton	....	....	....	....	....	....	....	....	....	....
Cass Lake	1	....	....	....	....	....	....	....	1	2
Chaska	1	....	....	....	....	1	....	....	....	2
Chatfield	....	....	....	1	1	....	....	....	....	2
Chisholm	....	....	....	....	....	....	....	....	....	....
Claremont	1	....	....	....	....	....	....	....	....	1
Clarkfield	2	....	....	....	1	....	....	....	1	4
Clearwater	....	....	....	....	....	....	....	....	2	2
Cloquet	....	....	....	....	....	....	....	....	....	....
Cokato	....	....	....	....	....	....	....	....	1	1
Coleraine	....	....	....	....	....	....	....	....	....	....
Cottonwood	1	....	....	....	....	....	....	....	....	1
Crookston	3	1	....	....	1	....	2	....	1	8
Crosby	....	1	....	....	....	....	....	....	....	1
Dassel	....	....	....	....	1	1	....	....	....	2
Dawson	1	2	....	....	....	....	....	....	....	3
Deer River	....	....	....	....	....	....	....	....	....	....
Delano	1	....	....	....	1	....	....	....	....	2
Detroit	1	....	....	....	1	....	....	....	1	3
Dodge Center	....	....	....	....	....	....	....	....	1	1
Duluth										
Cathedral	1	....	....	....	....	....	....	....	..	1
Central	13	8	....	1	3	....	....	..	3	30
R. E. Denfeld	1	....	....	....	....	....	....	....	1	2
Eagle Bend	....	....	....	....	....	....	....	....	..	....
East Grand Forks	....	....	....	....	....	....	....	....	..	....
Edgerton	....	....	....	....	1	....	....	....	..	1
Elbow Lake	....	1	....	....	....	....	....	....	1	2
Elk River	....	....	....	....	1	....	....	....	2	3
Elmore	....	....	....	....	....	....	....	....	..	....
Ely	2	....	....	....	....	....	....	....	1	3
Eveleth	2	2	....	....	....	....	....	....	..	4
Excelsior	1	....	....	....	....	....	....	....	2	3
Fairfax	1	....	....	....	....	....	....	....	..	1
Fairmont	4	....	....	....	2	....	....	....	..	6
Faribault	6	2	....	....	....	2	....	....	..	10
Farmington	1	....	....	....	1	....	....	....	..	2
Fergus Falls	4	....	....	....	2	....	....	....	1	7
Fertile	....	....	....	....	....	....	....	....	..	....
Forest Lake	1	....	....	....	....	....	....	....	1	2
Fosston	....	....	....	....	....	....	....	....	2	2
Franklin	....	....	....	....	....	....	....	....	..	....
Frazee	....	....	....	....	....	....	....	....	..	....
Fulda	....	1	....	....	....	1	....	....	..	2
Gaylord	....	....	....	....	....	....	....	....	..	....
Gilbert	....	....	....	....	....	....	....	1	..	1
Glencoe	5	1	....	....	....	....	....	....	4	10
Glenwood	1	1	....	....	....	1	....	....	..	3
Graceville	....	....	....	....	....	....	....	....	..	....
Grand Meadow	1	....	....	....	....	....	....	....	....	1
Grand Rapids	....	....	....	....	2	1	....	....	1	4
Granite Falls	1	....	....	....	....	....	....	....	....	1
Grove City	2	....	....	....	....	....	....	....	....	2
Hallick	2	....	....	....	....	....	....	....	....	2
Halstad	1	....	....	....	....	....	....	....	....	1
Harmony	1	....	....	....	....	....	....	....	..	1
Hastings	1	2	....	....	....	....	....	....	1	4
Hawley	....	1	....	....	....	....	....	....	..	1
Hector	1	....	....	....	....	....	....	....	..	1
Henderson	....	....	....	....	....	....	....	....	..	....
Hendrum	1	....	....	....	....	1	....	....	..	2
Henning	....	....	....	....	....	1	....	....	..	1
Herman	1	....	....	....	....	....	....	....	..	1
Heron Lake	1	....	....	....	....	....	....	....	2	3

TABLE VI—*Continued*

SCHOOLS FROM WHICH ENTRANTS WERE RECEIVED, 1915-16

	Science, Literature, and the Arts	Engineering	Chemistry	Mines	Dentistry	Pharmacy	Nurses	Special Law	Agriculture	Total
Hibbing	4	3	....	....	....	....	....	....	....	7
Hinckley	1	....	....	....	....	....	....	....	....	1
Hopkins	2	....	....	....	....	1	....	....	....	3
Houston	1	....	....	....	....	....	....	....	1	2
Howard Lake	....	....	....	....	....	....	....	....	1	1
Hutchinson	3	1	....	....	....	1	....	....	1	6
International Falls	....	....	....	....	....	....	....	....	....	....
Ivanhoe	....	....	....	....	....	....	....	....	....	....
Jackson	....	....	....	....	1	....	....	....	....	1
Janesville	....	....	....	....	1	....	....	....	1	2
Jasper	1	....	....	....	....	....	....	....	....	1
Jordan	1	....	....	....	....	....	....	....	....	1
Kasota	1	....	....	....	....	....	....	....	....	1
Kasson	....	....	....	....	....	....	....	....	....	....
Kenyon	....	....	....	....	....	....	....	....	1	1
Kerkhoven	....	....	....	....	....	....	....	....	....	....
Kimball	....	....	....	....	....	1	....	....	....	1
Lake Benton	....	....	....	....	....	....	....	....	....	....
Lake City	1	....	....	....	....	....	....	....	....	1
Lake Crystal	....	....	....	....	....	....	....	....	....	....
Lakefield	2	1	....	....	....	....	....	....	1	4
Lake Park	2	....	....	....	....	....	....	....	....	2
Lamberton	....	....	....	....	....	....	....	....	....	....
Lanesboro	....	1	....	....	....	....	....	....	....	1
Le Roy	1	2	....	....	....	....	....	....	....	3
Le Sueur	....	....	....	....	....	....	....	....	1	1
Le Sueur Center	1	....	....	....	....	....	....	....	....	1
Lewiston	....	....	....	....	....	....	....	....	....	....
Lindstrom	....	....	1	....	....	....	....	....	....	1
Litchfield	1	2	....	....	....	....	....	....	2	5
Little Falls	1	1	1	....	....	....	....	....	....	3
Littlefork	....	....	....	....	....	....	....	....	1	1
Long Prairie	1	....	....	....	....	....	....	....	....	1
Luverne	1	....	....	....	1	....	....	....	1	3
Lyle	....	....	....	....	....	....	....	....	1	1
McIntosh	....	....	....	....	....	....	....	....	....	....
Mabel	2	1	....	....	....	1	....	....	....	4
Madelia	....	1	....	....	1	....	....	....	....	2
Madison	1	....	....	....	....	1	1	....	....	3
Mahnomen	....	....	....	....	....	....	....	....	....	....
Mankato	10	3	....	....	1	....	....	....	2	16
Mantorville	....	....	....	....	....	....	....	....	....	....
Maple Lake	....	3	....	....	....	....	....	....	....	3
Maple Plain	1	....	....	....	....	....	....	....	....	1
Mapleton	....	....	....	....	2	....	....	....	....	2
Marietta	....	....	....	....	....	....	....	....	....	....
Marshall	2	....	....	....	1	....	....	....	....	3
Mazeppa	1	1	....	....	....	....	....	....	....	2
Medford	....	....	....	....	....	....	....	....	....	....
Melrose	1	....	....	....	....	....	....	....	....	1
Milaca	....	1	....	....	1	....	....	....	....	2
Minneapolis										
Central	17	11	1	1	4	2	1	1	17	109
East	58	5	1	1	2	1	1	2	22	93
North	41	14	1	2	9	1	2	....	6	76
South	32	3	1	2	8	....	....	....	4	50
West	76	8	4	....	2	2	2	....	9	103
Minneota	....	....	....	....	2	....	....	....	....	2
Minnesota Lake	....	....	....	....	....	....	....	....	....	....
Montevideo	....	1	....	....	....	....	....	....	....	1
Montgomery	1	....	....	....	....	....	....	....	....	1
Monticello	....	....	....	....	....	....	....	....	....	....
Montrose	....	....	....	....	....	....	....	....	....	....
Moorhead	2	....	....	....	....	....	....	....	....	2
Mora	....	....	....	....	....	....	....	....	....	....

TABLE VI—*Continued*

SCHOOLS FROM WHICH ENTRANTS WERE RECEIVED, 1915-16

	Science, Literature, and the Arts	Engineering	Chemistry	Mines	Dentistry	Pharmacy	Nurses	Special Law	Agriculture	Total
Morgan	2	....	....	....	....	....	....	....	....	2
Morris	.....	....	....	....	1	....	....	....	....	1
Morton	1	....	....	....	1	....	....	....	....	2
Mountain Iron	.....	....	....	....	....	....	....	....	....	....
Mountain Lake	.....	....	....	....	1	....	....	....	....	1
New London	.....	....	....	....	....	....	....	....	....	....
New Prague	2	1	....	....	....	....	....	....	....	3
New Richland	.....	....	....	....	....	1	....	....	....	1
New Ulm	1	1	....	....	....	....	....	....	....	2
North Branch	1	....	....	....	2	....	....	....	1	4
Northfield	.....	1	....	....	....	1	....	....	....	2
North St. Paul	.....	....	....	....	....	....	....	....	....	....
Norwood-Young America	.....	....	....	....	....	....	....	....	....	....
Olivia	.....	....	....	....	....	....	....	....	2	2
Ortonville	1	1	....	....	....	....	....	....	1	3
Osakis	.....	....	....	....	1	....	....	....	....	1
Owatonna	3	....	....	....	....	....	....	....	1	4
Parkers Prairie	.....	....	....	....	1	....	....	....	....	1
Park Rapids	1	....	....	....	1	....	....	....	1	3
Paynesville	1	....	....	....	....	....	....	....	....	1
Pelican Rapids	1	....	....	....	1	....	....	....	....	2
Perham	.....	....	....	....	....	....	....	....	....	....
Pine City	6	....	....	....	1	....	....	....	....	7
Pine Island	.....	....	....	....	....	....	....	....	....	....
Pine River	.....	....	....	....	....	....	....	....	....	....
Pipestone	3	1	....	....	1	....	....	....	....	5
Plainview	.....	....	....	....	1	....	....	....	....	1
Preston	.....	....	....	....	1	....	....	1	....	2
Princeton	.....	3	....	....	....	....	....	....	....	3
Red Lake Falls	1	1	....	....	1	....	....	....	....	3
Red Wing	4	2	....	....	1	....	....	....	2	9
Redwood Falls	3	....	....	....	....	....	....	....	....	3
Renville	.....	....	....	....	....	....	....	....	....	....
Rochester	4	....	....	....	....	1	1	....	....	6
Royalton	.....	....	....	....	....	....	....	....	....	....
Rush City	.....	....	....	....	....	....	....	....	....	....
Rushford	1	1	....	....	1	1	....	....	....	4
Sacred Heart	.....	....	....	....	1	....	....	....	....	1
Saint Charles	1	....	....	....	....	....	....	....	....	1
Saint Cloud	.....	2	....	....	5	....	....	....	2	9
Saint James	1	....	....	....	2	....	....	....	....	3
Saint Louis Park	1	1	....	....	....	....	....	....	1	3
Saint Paul										
Central	52	9	2	3	3	....	....	....	15	84
Humboldt	15	1	....	....	....	....	....	....	4	20
Johnson	8	1	....	....	2	....	1	1	1	14
Mechanic Arts	17	9	....	3	4	1	1	....	5	40
Saint Peter	.....	....	....	....	....	....	....	....	1	1
Sandstone	.....	....	....	....	....	....	....	....	....	....
Sauk Center	.....	1	....	....	....	....	....	....	2	3
Sauk Rapids	.....	....	....	....	....	....	....	....	....	....
Shakopee	.....	....	....	....	....	....	....	....	....	....
Sherburn	.....	....	....	....	....	....	....	....	....	....
Slayton	1	....	1	....	....	....	....	....	....	2
Sleepy Eye	.....	....	....	....	....	....	....	....	....	....
South Saint Paul	.....	....	....	....	....	....	....	....	....	....
Springfield	.....	....	....	....	....	....	....	....	....	....
Spring Grove	1	....	....	....	....	....	....	....	....	1
Spring Valley	1	1	....	....	....	....	....	....	....	2
Staples	1	....	....	....	....	....	1	....	....	2
Starbuck	.....	....	....	....	....	1	....	....	....	1
Stephen	.....	....	....	....	....	....	....	....	....	....
Stewartville	1	....	....	....	....	....	....	....	....	1

TABLE VI—*Continued*

SCHOOLS FROM WHICH ENTRANTS WERE RECEIVED, 1915-16

	Science, Literature, and the Arts	Engineering	Chemistry	Mines	Dentistry	Pharmacy	Nurses	Special Law	Agriculture	Total
Stillwater	6	1	....	....	1	....	....	....	....	8
Thief River Falls	2	1	....	....	....	....	....	....	....	3
Tower	.....	....	....	....	1	1	....	....	1	3
Tracy	1	....	....	....	....	....	....	....	....	1
Truman	.....	....	....	....	....	....	....	....	....	....
Two Harbors	.....	....	....	....	....	....	....	....	1	1
Twin Valley	2	....	....	....	....	....	....	....	1	3
Tyler	.....	....	....	....	....	....	....	....	....	....
Villard	.....	....	....	....	....	....	....	....	....	....
Virginia	1	1	1	....	....	4	....	....	1	8
Wabasha	.....	....	....	....	1	....	....	....	1	2
Waconia	.....	....	....	....	....	....	....	....	....	....
Wadena	1	....	....	....	....	....	....	....	1	2
Wahkon	.....	....	....	....	....	....	....	....	1	1
Walker	.....	1	....	....	....	....	....	....	....	1
Warren	.....	....	....	....	1	....	....	....	1	2
Waseca	2	....	....	....	....	1	....	....	....	3
Waterville	2	....	....	....	....	....	....	....	....	2
Watertown	2	....	....	....	....	....	....	....	....	2
Wayzata	.....	....	....	....	....	....	....	....	....	....
Welcome	.....	....	....	....	....	....	....	....	....	....
Wells	.....	....	....	....	....	1	....	....	....	1
Westbrook	.....	....	....	....	....	....	....	....	....	....
West Concord	.....	....	....	....	....	....	....	....	....	....
Wheaton	.....	2	....	....	....	....	....	....	1	3
White Bear	3	....	....	....	1	....	....	....	....	4
Willmar	3	1	....	....	1	2	....	....	1	8
Windom	2	....	....	....	1	....	....	....	....	3
Winnebago	.....	1	....	....	....	....	....	....	....	1
Winona	2	....	....	....	1	....	....	....	....	3
Winthrop	.....	1	....	....	....	1	....	....	3	5
Worthington	.....	1	....	....	....	....	....	....	....	1
Zumbrota	.....	....	....	....	1	1	....	....	....	2
CALIFORNIA										
Hollywood	1	....	....	....	....	....	....	....	....	1
Ontario	1	....	....	....	....	....	....	....	....	1
Sacramento	.....	....	....	....	....	....	....	....	1	1
COLORADO										
East Denver	.....	1	....	....	....	....	....	....	....	1
DISTRICT OF COLUMBIA										
Washington										
Central	.....	1	....	....	....	....	....	....	....	1
Miss Madera's School	1	....	....	....	....	....	....	....	....	1
Western	1	....	....	....	....	....	....	....	....	1
IDAHO										
Orofino	1	....	....	....	....	....	....	....	....	1
Spirit Lake	1	....	....	....	....	....	....	....	....	1
ILLINOIS										
Hoopeston	.....	....	....	....	....	....	....	....	1	1
La Grange	.....	....	....	1	....	....	....	....	....	1
Lake Forest	1	....	....	....	....	....	....	....	....	1
Moline	1	....	....	....	....	....	....	....	....	1
Mt. Carroll	2	....	....	....	....	....	....	....	....	2
New Trier Township	.....	....	....	....	....	....	....	....	1	1
Ottawa	1	....	....	....	....	....	....	....	....	1
Rochelle	1	....	....	....	....	....	....	....	....	1
Sandwich	1	....	....	....	....	....	....	....	....	1

TABLE VI—*Continued*

SCHOOLS FROM WHICH ENTRANTS WERE RECEIVED, 1915-16

	Science, Literature, and the Arts	Engineering	Chemistry	Mines	Dentistry	Pharmacy	Nurses	Special Law	Agriculture	Total
INDIANA										
Boonville	.....	....	....	....	....	....	....	....	1	1
Gary—Emerson H. S.	1	....	....	....	....	....	....	....	....	1
Washington	.....	1	....	....	....	....	....	....	....	1
IOWA										
Cedar Rapids	.....	1	....	....	....	....	....	....	....	1
Charles City	.....	1	....	....	....	....	....	....	2	3
Cresco	3	....	1	....	....	....	1	....	....	5
Davenport	.....	....	....	....	....	....	....	....	1	1
Decorah	2	....	....	....	....	....	....	....	....	2
Luther College	.....	....	....	....	1	....	....	....	....	1
Dubuque	.....	1	....	....	....	....	....	....	....	1
College H. S.	1	....	....	....	....	....	....	....	....	1
Eagle Grove	.....	1	....	....	....	....	....	....	....	1
East Waterloo	.....	....	....	....	....	....	....	1	....	1
Essex	1	....	....	....	....	....	....	....	....	1
Estherville	2	....	....	....	....	....	....	....	....	2
Iowa Falls—Ellsworth Ac.	.....	1	....	....	....	....	....	....	....	1
Lansing	1	....	....	....	....	....	....	....	....	1
Leon	1	....	....	....	....	....	....	....	....	1
Little Sioux	1	....	....	....	....	....	....	....	....	1
Maquoketa	.....	1	....	....	....	....	....	....	....	1
Marshalltown	.....	1	....	....	....	....	....	....	....	1
Mason City	1	1	1	....	....	....	....	....	....	3
Monona	.....	....	....	....	1	....	....	....	....	1
Nevada	1	....	....	....	....	....	....	....	....	1
Paullina	1	....	....	....	....	....	....	....	....	1
Postville	1	....	....	....	....	....	....	....	....	1
Rock Rapids	1	....	....	....	....	....	....	....	....	1
Rockwell City	.....	....	....	....	....	....	1	....	....	1
Sioux City	3	....	....	....	....	....	....	....	....	3
Spencer	2	....	....	....	....	....	....	....	....	2
Springville	1	....	....	....	....	....	....	....	....	1
Storm Lake	1	....	....	....	....	....	....	....	....	1
West Union	1	....	....	....	....	....	....	....	....	1
West Waterloo	1	....	....	....	....	....	....	....	....	1
KENTUCKY										
Georgetown—Normal	1	....	....	....	....	....	....	....	....	1
MASSACHUSETTS										
Boston—English H. S.	1	....	....	....	....	....	....	....	....	1
Lowell	1	....	....	....	....	....	....	....	....	1
Waltham	.....	1	....	....	....	....	....	....	....	1
MICHIGAN										
Calumet	1	2	....	....	....	....	....	....	....	3
Crystal Falls	1	....	....	....	....	....	....	....	....	1
Detroit	.....	....	....	....	....	....	....	....	1	1
Lapeer	1	....	....	....	....	....	....	....	....	1
Saginaw	.....	....	....	....	1	....	....	....	....	1
MISSOURI										
Saint Joseph	1	....	....	....	....	....	....	....	....	1
Saint Louis										
Principia	.....	1	....	....	....	....	....	....	....	1
U. of St. Louis H. S.	1	....	....	....	....	....	....	....	....	1
MONTANA										
Anaconda	3	....	....	....	....	....	....	....	....	3
Columbus	2	....	....	....	....	....	....	....	....	2
Great Falls	.....	1	....	....	....	....	....	....	....	1
Kalispell	.....	....	....	....	....	....	....	....	1	1
Miles City	2	....	....	....	....	....	....	....	....	2

TABLE VI—*Continued*

SCHOOLS FROM WHICH ENTRANTS WERE RECEIVED, 1915-16

	Science, Literature, and the Arts	Engineering	Chemistry	Mines	Dentistry	Pharmacy	Nurses	Special Law	Agriculture	Total
NEBRASKA										
Albion	1	....	....	....	....	....	....	....	....	1
McCook	.....	....	....	....	....	....	....	....	1	1
Oakland	1	....	....	....	....	....	....	....	....	1
Omaha	2	....	....	....	....	....	....	....	....	2
Stewart	.....	....	....	....	1	....	....	....	....	1
NEW JERSEY										
Paterson	.....	....	....	....	....	....	....	....	1	1
NEW YORK										
Brooklyn										
Polytech. Prep. School	.....	....	....	1	....	....	....	....	....	1
NORTH DAKOTA										
Bathgate	1	....	....	....	....	....	....	....	....	1
Beech	.....	1	....	....	....	....	....	....	....	1
Berthold	1	....	....	....	....	....	....	....	....	1
Bismarck	2	....	....	....	....	....	....	....	....	2
Bottineau	.....	....	....	....	1	....	....	....	....	1
Casselton	.....	....	....	....	1	....	....	....	....	1
Devil's Lake	1	....	....	....	....	....	....	....	....	1
Drayton	1	....	....	....	....	....	....	....	....	1
Enderlin	2	....	....	....	....	....	....	....	....	2
Grand Forks	.....	....	....	....	....	1	....	....	....	1
Hunter	1	....	....	....	....	....	....	....	....	1
Lisbon	1	....	....	....	....	....	....	....	....	1
Marmarth	.....	....	....	....	....	....	....	....	....	....
Mayville	1	....	....	....	1	....	1	....	....	3
Minot	.....	....	....	....	3	....	....	....	....	3
New Rockford	1	....	....	....	....	....	....	....	....	1
Collegiate Institute	1	....	....	....	....	....	....	....	....	1
Rugby	1	....	....	....	....	....	....	....	....	1
Valley City	1	....	....	1	....	....	....	....	....	2
Williston	2	....	....	....	....	....	....	....	....	2
OHIO										
Youngstown	1	....	....	....	....	....	....	....	....	1
OREGON										
Portland										
Jefferson	1	....	....	....	....	....	....	....	....	1
Washington	1	....	....	....	....	....	....	....	....	1
PENNSYLVANIA										
Chambersburg	1	....	....	....	....	....	....	....	....	1
Harrisburg	1	....	....	....	....	....	....	....	....	1
Honesdale	1	....	....	....	....	....	....	....	....	1
Pittsburgh										
Carnegie Inst. of Tech.	.....	....	....	1	....	....	....	....	....	1
SOUTH DAKOTA										
Aberdeen	2	1	....	....	....	....	....	....	1	4
Big Stone City	1	....	....	....	....	....	....	....	....	1
Britton	3	....	....	....	....	....	....	....	....	3
Deadwood	2	....	....	....	....	....	....	....	....	2
Emery	1	....	....	....	....	....	....	....	....	1
Flandreau	.....	....	....	....	1	....	....	1	1	3
Garretson	.....	....	....	....	....	1	....	....	....	1
Groton	1	....	....	....	1	....	....	....	....	2
Hecla	1	....	....	....	....	....	....	....	....	1
Iroquois	1	....	....	....	....	....	....	....	....	1
Lake Preston	.....	1	....	....	....	....	....	....	....	1

TABLE VI—*Continued*

SCHOOLS FROM WHICH ENTRANTS WERE RECEIVED, 1915-16

	Science, Literature, and the Arts	Engineering	Chemistry	Mines	Dentistry	Pharmacy	Nurses	Special Law	Agriculture	Total
Milbank	1	....	....	....	....	1	....	....	....	2
Mitchell	1	....	....	....	....	....	....	....	....	1
Redfield	1	....	....	....	....	....	....	....	....	1
Sioux Falls										
All Saints	3	....	....	....	....	....	....	....	1	4
Washington	1	....	....	....	....	....	....	....	1	2
Vienna	1	....	....	....	....	....	....	....	....	1
Watertown	1	....	....	....	....	....	....	....	....	1
Webster	1	....	....	....	....	....	....	....	....	1
TEXAS										
Houston	1	....	....	....	....	....	....	....	....	1
WASHINGTON										
Ellensburg	.....	....	....	....	1	....	....	....	....	1
Newport	1	....	....	....	....	....	....	....	....	1
Spokane										
Lewis and Clarke	1	....	....	....	....	....	....	....	....	1
North Central	.....	....	....	....	....	....	....	....	1	1
WISCONSIN										
Arcadia	.....	....	....	....	1	....	....	....	....	1
Ashland	2	....	....	....	....	....	....	....	....	2
Barron	.....	....	....	....	....	1	....	....	....	1
Bayfield	1	....	....	....	....	....	....	....	....	1
Cambria	1	....	....	....	....	....	....	....	....	1
Chippewa Falls	1	....	....	....	....	....	....	....	....	1
Notre Dame H. S.	1	....	....	....	....	....	....	....	....	1
Delafield—St. Johns	3	1	....	....	....	....	....	....	....	4
Dodgeville	.....	....	....	....	1	....	....	....	....	1
Eau Claire	.....	1	....	....	1	....	....	....	....	2
Ellsworth	1	....	....	....	....	....	....	....	....	1
Fairchild	1	....	....	....	....	....	....	....	....	1
Fond du Lac	.....	....	....	....	....	....	....	....	1	1
Hayward	1	....	....	....	....	....	....	....	....	1
Hudson—Galahad	1	....	....	....	....	....	....	....	....	1
Independence	.....	1	....	....	....	....	....	....	....	1
Kenosha	1	....	....	....	....	....	....	....	....	1
La Crosse	2	....	....	....	....	....	1	....	1	4
Ladysmith	1	....	....	....	....	1	....	....	....	2
Menominee	1	....	....	....	1	....	....	....	....	2
Milwaukee—Downer	1	....	....	....	....	....	....	....	....	1
Mondoir	1	....	....	....	....	....	....	....	....	1
Monroe	.....	....	....	....	....	....	....	....	1	1
Necedah	2	....	....	....	....	....	....	....	....	2
New Richmond	2	....	....	....	....	....	....	....	....	2
Reedsburg	1	....	....	....	....	....	....	....	....	1
St. Croix Falls	1	....	....	....	....	....	1	....	....	2
Sinsinawa—St. Clara	1	....	....	....	....	....	....	....	1	2
Stanley	1	....	....	....	....	....	....	....	....	1
Superior	1	2	....	....	1	....	....	....	....	4
Viroqua	.....	....	....	....	....	1	....	....	....	1
Westby	1	....	....	....	....	....	....	....	....	1
CANADA										
Calgary Coll. Inst.	.....	1	....	....	....	....	....	....	....	1
Weyburn, Sask.	.....	....	....	....	....	....	....	....	1	1
Winnipeg, Univ. Prep	.....	1	....	....	....	....	....	....	....	1
NORWAY										
Stavanger	1	....	....	....	....	....	....	....	....	1
RUSSIA										
Commercial School	1	....	....	....	....	....	....	....	2	3

TABLE I. SUMMARY OF RECEIPTS

1915-1916

Receipts from Students		
Tuition and Fees, Schedule A*	$299,266.84	
General and Military Deposits	65,622.49	
Dining Halls and Dormitories, Schedule B	189,959.19	
		$554,848.52
Receipts from Interest		
Swamp Land Interest	26,536.20	
Land Contracts	5,316.26	
University Land Fund	48,786.32	
		80,638.78
Receipts from Federal Government		
Morrill Fund	25,000.00	
Nelson Fund	25,000.00	
Hatch Fund	11,250.00	
Adams Fund	11,250.00	
Smith-Lever Fund	43,556.39	
		$116,056.39
Receipts from State		
23/100 Mill Tax	335,852.25	
Maintenance Appropriation	550,000.00	
Sundry Support Appropriations, Schedule C	592,025.00	
Buildings and Equipment Appropriations, Schedule D	206,650.00	
		1,684,527.25
Receipts from Other Sources		
Dental Infirmary	24,272.96	
Hospital and Free Dispensary	8,395.95	
Farm Products, Livestock, etc., Schedule E	73,226.60	
Rent of Campus Houses	9,458.00	
Lyceum and University Weeks	34,359.45	
Trolley System	11,542.97	
Printing Department	9,687.14	
Stock Testing Fees, etc., University Farm Extension	4,121.65	
Sundry Items, Schedule F	63,362.10	
		238,426.82
Cold Storage	10,933.58	
Storehouse Sales	95,425.82	
Trust Fund Receipts	18,159.73	
		124,519.13
Grand Total		$2,799,016.89

* See pages 148 and 149, Nineteenth Biennial Report of the Board of Regents, for Schedules A to F.

TABLE VI—*Continued*

SUMMARY

Wisconsin	79	Pennsylvania	4	Oregon	2
Iowa	44	Washington	4	Colorado	1
South Dakota	33	California	3	Kentucky	1
North Dakota	27	Washington, D. C.	3	New Jersey	1
Illinois	10	Indiana	3	New York	1
Montana	9	Massachusetts	3	Ohio	1
Michigan	7	Missouri	3	Texas	1
Nebraska	6	Idaho	2		

Total number of entrants for Minnesota	1103
Total number for United States, outside of Minnesota	199
Total for foreign countries	7
Grand Total	1309

Table VII shows the number and kinds of degrees conferred by the University, 1914-1916.

Table VIII continues the chart showing the number and kinds of degrees conferred during the past eighteen years.

TABLE VII. DEGREES CONFERRED, 1914-1916

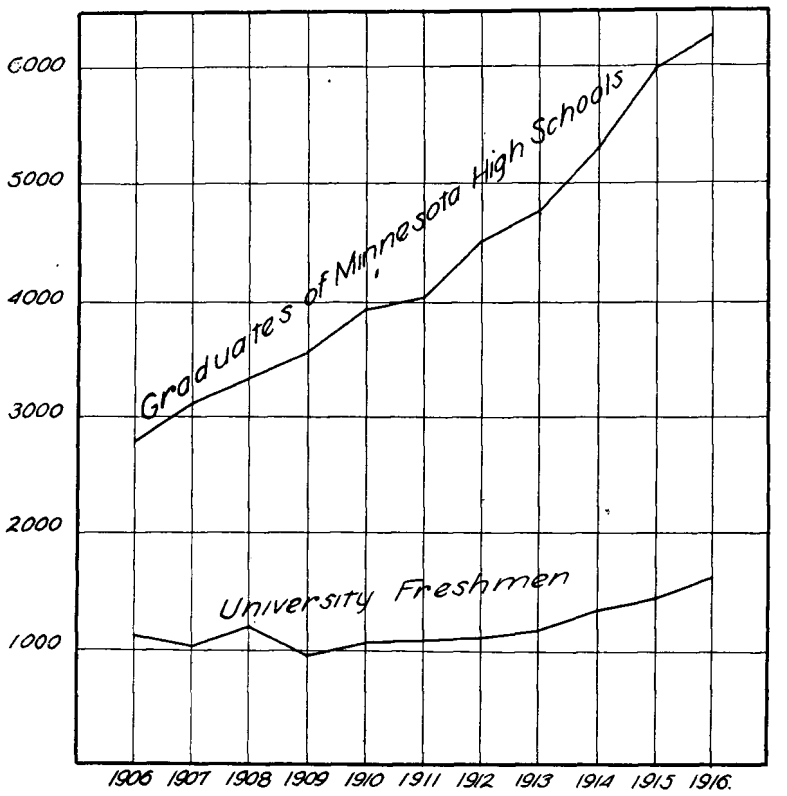
Colleges and Degrees	Year 1914-1915			Year 1915-1916		
	Men	Women	Total	Men	Women	Total
Science, Literature, and the Arts:						
B.A.	78	153	231	84	148	232
B.A. in Music	....	.....	.....	....	4	4
B.S.	30	1	31	33	.....	33
Engineering and Architecture:						
C.E.	11	.....	11	8	.....	8
E.E.	16	.....	16	10	.....	10
M.E.	10	.....	10	7	.....	7
B.S. in Engineering	48	.....	48	57	.....	57
B.S. in Architecture	....	.....	.....	4	.....	4
Agriculture:						
B.S. in Agriculture	44	.....	44	51	.....	51
B.S. in Forestry	7	.....	7	10	.....	10
B.S. in Home Economics	....	41	41	....	37	37
Law:						
LL.B.	43	.....	43	30	.....	30
Medicine and Surgery:						
M.D.	35	1	36	33	1	34
Graduate in Nursing	....	11	11	....	9	9
Dentistry:						
D.D.S.	65	.....	65	79	1	80
Mines:						
E.M.	13	.....	13	9	.....	9
Pharmacy:						
Pharm.B.	5	2	7	1	.....	1
Graduate in Pharmacy	20	3	23	22	5	27
B.S. in Pharmacy	1	.....	1	....	.....	.....
M.S. in Pharmacy	....	.....	.....	....	2	2
Analytical and Applied Chemistry:						
Chem.E.	2	.....	2	....	.....	.....
Bachelor of Science	....	.....	.....	1	.....	1
B.S. in Chemistry	5	.....	5	3	.....	3
Education:						
B.A. in Education	17	27	44	15	24	39
Graduate:						
M.A.	21	17	38	20	15	35
M.S.	16	2	18	19	.....	19
Ph.D.	5	.....	5	6	1	7
Total	492	258	750	504	245	749

TABLE VIII—DEGREES CONFERRED 1889-1916

College or School	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916
College of Science, Literature, and the Arts:																												
Bachelor of Arts	7	11	15	16	26	17	29	28	26	18	22	26	22	181	160	180	197	224	194	214	185	216	198	214	243	234	231	232
Bachelor of Arts in Music	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	4
Bachelor of Science	10	22	13	19	21	36	35	44	46	58	56	62	55	...	...	...	1	2	14	1	7	12	27	21	23	17	31	33
Bachelor of Literature	9	11	17	16	26	19	34	31	37	41	53	44	49	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bachelor of Philosophy	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Master of Arts	1	...	1	1	4	4	3	6	6	6	8	5	5	25	20	15	...	...	...	...	...	...	...	...	...	...	...	...
Master of Science	...	...	...	1	4	2	6	5	7	9	5	1	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Master of Literature	...	1	...	...	1	...	...	3	4	4	4	1	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Doctor of Philosophy	...	...	...	1	2	2	1	...	3	3	3	3	2	3	3	3	...	...	...	...	...	...	...	...	...	...	...	...
Doctor of Science	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
College of Engineering and Architecture:																												
Civil Engineer	...	...	...	...	...	1	...	...	4	7	2	4	6	9	14	6	16	13	18	29	21	20	23	5	20	13	11	8
Mechanical Engineer	...	...	...	...	...	1	...	...	6	5	4	4	2	10	4	5	13	7	17	16	21	13	10	5	9	4	10	7
Electrical Engineer	...	...	...	...	...	...	...	1	8	8	6	9	7	6	14	12	20	28	16	25	28	18	31	6	13	9	16	10
Bachelor of Science in Engineering	...	...	...	...	...	...	...	...	...	...	...	1	1	1	2	1	1	...	...	6	4	1	2	52	33	53	48	57
Bachelor of Civil Engineering	1	9	2	2	5	4	4	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bachelor of Mechanical Engineering	...	3	1	2	2	1	3	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bachelor of Electrical Engineering	...	...	2	4	6	1	7	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Master of Science in Engineering	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Bachelor of Architecture	...	...	...	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bachelor of Science in Architecture	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4
College of Agriculture:																												
Bachelor of Science in Agriculture	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	7	9	4	18	17	11	8	19	34	44	51
Bachelor of Science in Home Economics	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	1	1	2	4	11	9	14	17	27	41	37
Master of Science in Agriculture	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...
Bachelor of Agriculture	...	...	...	...	...	1	2	1	2	1	4	6	4	2	2	3	...	...	...	...	...	...	...	...	...	...	...	...
Master of Agriculture	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Master of Forestry	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bachelor of Science in Forestry	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	4	...	1	2	8	17	13	13	12	7	10
Law School:																												
Doctor of Civil Law	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	1	...	...	...	...	...
Bachelor of Laws	3	40	49	57	84	89	89	111	42	105	69	114	104	91	75	104	97	102	88	85	83	87	105	55	53	35	43	30
Master of Laws	...	...	...	5	7	13	2	18	19	10	12	11	8	7	16	11	10	10	4	6	22	9	10	...	...	...	...	...
Medical School:																												
Doctor of Medicine (Homeopathic)	3	2	4	4	4	8	3	5	8	11	...	4	7	4	3	6	5	4	1	6	3	1	...	...	...	...	...	...
Doctor of Medicine	16	15	19	28	37	38	49	47	56	17	39	46	69	63	73	71	74	49	39	32	51	31	19	37	45	31	36	34
Graduate in Nursing	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	4	6	11	9
College of Dentistry:																												
Doctor of Dental Surgery	1	6	7	4	...	...	...	...	...	...	...	...	...	...	37	25	52	41	30	43	51	46	49	62	63	86	65	80
Doctor of Dental Medicine	...	...	...	...	13	6	12	14	28	14	20	36	35	32	...	...	...	...	...	...	...	...	...	...	...	...	...	...
School of Mines:																												
Engineer of Mines	...	...	...	...	...	...	...	...	...	...	2	8	5	2	11	11	15	13	18	15	10	26	26	23	11	9	13	9
Mining Engineer	...	...	...	...	...	...	1	...	3	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bachelor of Mining Engineering	...	...	...	...	...	2	1	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Metallurgical Engineer	...	...	...	...	...	...	...	...	...	...	...	...	2	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...
College of Pharmacy:																												
Bachelor of Pharmacy	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	18	24	19	23	12	24	28	7	1
Doctor of Pharmacy	...	...	...	...	...	6	12	15	8	12	21	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Master of Pharmacy	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	1	2	...	...
Pharmaceutical Chemist	...	...	...	...	...	...	...	...	...	...	...	16	15	19	8	14	16	17	...	...	...	...	...	...	...	...	23	...
Graduate in Pharmacy	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	27
Master of Science in Pharmacy	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
Bachelor of Science in Pharmacy	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
School of Chemistry:																												
Analytical Chemist	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	1	...	...	...	...	...	...	...	...	...	...
Bachelor of Science in Chemistry	...	...	...	...	...	...	...	...	...	...	...	...	...	3	1	4	...	...	5	7	6	11	10	17	8	3	5	3
Bachelor of Science in Chemical Engineering	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	3	3	3	...	...	...	...	...
Bachelor of Science	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	5	3	...	1
Chemical Engineer	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	2	5	2	...
College of Education:																												
Bachelor of Arts in Education	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	11	16	31	34	41	37	54	44	39
Graduate School:																												
Master of Arts	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	14	16	20	21	30	27	26	22	30	30	38	35
Master of Science	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	4	2	7	3	7	9	5	11	18	19
Master of Literature	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Doctor of Philosophy	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	2	2	3	5	1	1	2	3	2	5	7
Doctor of Science	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...
Master of Agriculture	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	2	...	...	...	...	...	...	...	...	...	...	...
Master of Forestry	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	1	...	...
Total	51	120	130	162	243	251	293	343	317	335	330	402	424	460	445	474	549	544	502	547	601	616	642	627	681	711	750	749

Table IX shows the geographical distribution of all students of collegiate grade exclusive of the Summer Session and should not be confused with Table VI which shows the distribution of entrants only.

PROPORTION OF UNIVERSITY ENTRANTS TO HIGH-SCHOOL GRADUATES



TEACHING STAFF

Full-time service for a University teacher.—This subject is fully discussed in the *Nineteenth Biennial Report,* (pp. 41-42). The results of inquiry at Minnesota are compared with studies made at the Universities of Wisconsin, Indiana, and California. A number of tables are included which show the amount of time

given to different kinds of instruction, etc., in all these institutions.

Ratio of teachers to students.—August 1, 1916, the total number of individuals on the faculty was 717; reduced to a full-time basis for collegiate instruction only, this number was 378. This gave a ratio of faculty to students of one to thirteen for the University as a whole. In the Arts College this ratio was one to eighteen.

Overcrowding in the Arts College.—The figure on page 29 shows the rapid increase in the number of graduates from the high schools of Minnesota during the last ten years. It also discloses the fact that in recent years the freshman class of the University has sustained a fairly fixed ratio to the number of high school graduates in the state. It is the rapid increase of the latter that has thrown upon the University, and especially the Arts College, a disconcerting burden of instruction. The various aspects of the problem created by this situation are discussed in detail with illustrative diagrams on pages 46-49 in the *Nineteenth Biennial Report.*

Average salaries for different ranks.—The average salary for deans as of August 1, 1916, is $5,215; for assistant deans, $3,667; for departmental heads and chairmen, $3,610; for professors, $3,064; for associate professors, $2,695; for assistant professors who also act as administrators, $1,983; for assistant professors as a group, $1,992; for instructors, $1,282; for assistants, $650. The average for deans is somewhat lowered by the inclusion of the salary of the dean of women. The average for professors is also influenced by the fact that, until five years ago when the rank of associate professor was revived, men were given full professorial rank who now would be included in the associate professorial group.

A SURVEY OF THE COLLEGES, ETC.

College of Science, Literature, and the Arts.—(1) During the two years 1913-14 to 1915-16 enrollment in the College increased 47.5 per cent while the funds of the College increased only 3.4 per cent; this has necessitated an increase of fees for the year 1916-17. (2) In addition to offering a wider range of studies through the elective system, and to securing intellectual discipline and coherence of plan by grouping of studies, the College must

TABLE IX—GEOGRAPHICAL DISTRIBUTION OF COLLEGIATE STUDENTS, 1915-1916

	Science, Literature, and the Arts	Engineering	Agriculture	Law	Medical	Nurses	Dentistry	Pharmacy	Mines	Chemistry	Education	Graduate	Total
Foreign Countries													
Canada	5	6	2	.....	.....	.....	1	.....	.....	.....	.....	.....	14
China	3	2	.....	.....	.....	.....	.....	.....	5	1	.....	.....	11
Cuba	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Germany	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1
Greece	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
India	1	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	3	6
Italy	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1
Japan	1	1	.....	.....	.....	1	1	.....	.....	.....	.....	1	5
Montenegro	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Norway	.....	2	1	.....	.....	.....	4	.....	.....	.....	.....	.....	7
Siberia	.....	1	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	3
South Africa	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
Sweden	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Syria	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1
Turkey	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	1
Total	11	14	8	.....	1	1	7	1	5	3	.....	5	56
States													
Arizona	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1
Arkansas	.....	.....	1	.....	.....	.....	.....	.....	1	.....	.....	.....	2
California	1	.....	.....	.....	2	1	.....	.....	.....	.....	.....	.....	4
Colorado	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	2
District of Columbia	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	3
Florida	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1
Georgia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1
Idaho	1	1	1	.....	2	.....	.....	.....	.....	.....	.....	.....	5
Illinois	11	4	5	2	3	.....	.....	.....	1	.....	.....	7	33
Indiana	2	2	2	.....	1	.....	.....	.....	.....	.....	.....	2	7
Iowa	62	9	8	7	14	2	7	1	.....	2	2	6	120
Kansas	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	6
Kentucky	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	2
Maryland	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1
Massachusetts	4	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	8
Michigan	6	6	1	.....	1	.....	.....	.....	.....	.....	3	3	20
Missouri	2	2	.....	.....	2	.....	1	.....	.....	.....	.....	3	9
Montana	15	3	2	2	1	1	.....	.....	.....	1	1	1	30
Nebraska	1	.....	2	.....	1	1	.....	.....	.....	.....	.....	4	8
New Jersey	.....	.....	1	.....	.....	.....	.....	.....	1	.....	.....	1	3
New York	4	.....	.....	.....	.....	.....	.....	.....	1	.....	1	6	12
North Dakota	52	11	5	3	8	4	12	2	2	.....	1	4	104
Ohio	3	1	1	.....	.....	.....	.....	.....	.....	.....	.....	7	12
Oklahoma	2	.....	1	.....	.....	.....	.....	.....	.....	1	.....	1	5
Oregon	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1
Pennsylvania	.....	.....	1	1	.....	.....	.....	.....	.....	1	.....	5	8
Rhode Island	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1
South Carolina	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1
South Dakota	32	8	10	1	2	.....	3	3	.....	.....	4	2	65
Tennessee	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1	2
Utah	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1	2
Vermont	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1
Virginia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	2
Washington	2	1	.....	.....	9	.....	3	.....	.....	.....	.....	5	20
West Virginia	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1
Wisconsin	44	10	10	5	4	4	13	4	4	1	4	8	109
Total	245	63	51	19	53	12	39	11	10	6	16	85	610
Minnesota Counties													
Aitkin	3	.....	.....	1	.....	.....	.....	.....	1	.....	.....	1	6
Anoka	7	2	1	1	1	.....	1	2	.....	.....	.....	.....	15
Becker	10	1	7	1	1	1	4	.....	.....	.....	.....	.....	25
Beltrami	5	3	2	1	.....	.....	1	.....	.....	.....	.....	.....	12
Benton	1	.....	.....	.....	1	.....	.....	.....	.....	.....	1	.....	4
Big Stone	9	.....	2	2	.....	.....	.....	1	.....	.....	1	.....	14
Blue Earth	15	5	9	2	2	.....	8	1	.....	2	1	3	48
Brown	3	2	3	1	3	.....	.....	1	1	.....	1	.....	15
Carlton	8	2	4	.....	.....	.....	.....	1	.....	1	.....	1	17
Carver	6	.....	1	.....	3	.....	3	2	.....	.....	.....	.....	15
Cass	3	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	5
Chippewa	2	2	2	.....	.....	.....	.....	.....	.....	.....	.....	1	7
Chisago	4	1	4	1	.....	.....	6	.....	.....	1	.....	1	18
Clay	2	3	.....	1	.....	.....	.....	.....	.....	.....	2	.....	8
Clearwater	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1
Cook	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1
Cottonwood	11	.....	3	2	.....	2	2	1	.....	.....	.....	1	22
Crow Wing	4	3	2	1	2	.....	3	1	2	1	.....	.....	19
Dakota	8	3	5	1	1	.....	2	.....	.....	.....	1	1	22
Dodge	2	1	3	.....	.....	.....	.....	.....	.....	.....	.....	2	9
Douglas	7	1	4	.....	.....	.....	4	1	.....	.....	.....	.....	18
Faribault	8	2	1	.....	2	.....	2	1	.....	1	2	3	22
Fillmore	22	6	3	2	1	.....	11	2	2	.....	1	.....	40
Freeborn	6	1	2	.....	1	.....	1	.....	.....	.....	.....	.....	11
Goodhue	8	7	7	1	3	3	4	1	.....	.....	2	2	39
Grant	3	1	1	.....	1	.....	.....	.....	.....	.....	1	.....	10
Hennepin	1,118	203	232	70	91	14	113	33	28	31	37	119	2,079
Houston	7	1	3	.....	.....	.....	1	.....	.....	.....	.....	.....	12
Hubbard	4	.....	1	.....	.....	.....	2	.....	.....	.....	.....	.....	7
Isanti	2	1	2	.....	.....	.....	3	.....	.....	.....	.....	.....	8
Jackson	4	2	10	1	.....	1	2	.....	1	.....	1	1	23
Itasca	3	1	2	2	.....	.....	2	2	.....	.....	.....	.....	13
Kanabec	3	1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	6
Kandiyohi	8	5	3	1	.....	.....	4	2	.....	1	.....	.....	24
Kittson	3	.....	3	1	.....	.....	.....	.....	.....	.....	.....	1	8
Koochiching	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
Lac qui Parle	7	2	3	1	2	2	2	2	.....	.....	2	.....	23
Lake	4	2	2	3	.....	.....	.....	.....	.....	.....	1	.....	12
Le Sueur	13	2	10	.....	2	1	2	1	.....	.....	1	.....	32
Lincoln	1	.....	.....	.....	.....	.....	.....	.....	5	.....	.....	.....	6
Lyon	8	1	2	1	1	1	5	.....	.....	.....	.....	1	20
McLeod	20	1	9	2	1	.....	5	1	.....	.....	2	2	43
Mahnomen	.....	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	2
Marshall	5	.....	4	1	1	.....	1	1	.....	.....	.....	.....	13
Martin	6	1	1	.....	1	.....	3	2	.....	.....	.....	.....	13
Meeker	9	3	4	1	.....	2	5	2	.....	1	2	.....	29
Mille Lacs	1	4	1	.....	1	.....	3	.....	.....	.....	1	.....	10
Morrison	6	1	3	.....	.....	.....	.....	.....	1	.....	2	.....	14
Mower	15	4	8	.....	2	1	1	1	.....	.....	.....	.....	32
Murray	4	1	4	.....	1	.....	.....	2	.....	1	.....	.....	13
Nicollet	8	.....	2	2	1	.....	1	.....	.....	.....	.....	1	17
Nobles	5	3	5	.....	2	.....	1	.....	.....	.....	.....	1	17
Norman	8	.....	4	.....	.....	1	3	2	.....	.....	.....	.....	18
Olmsted	7	2	2	.....	1	4	1	2	1	.....	.....	32	51
Otter Tail	14	.....	4	3	3	.....	9	1	.....	.....	1	.....	36
Pennington	6	.....	2	1	1	.....	.....	.....	.....	.....	.....	1	11
Pine	9	.....	1	.....	.....	.....	1	.....	.....	1	.....	.....	12
Pipestone	8	2	2	.....	1	.....	4	.....	.....	.....	.....	.....	17
Polk	7	2	8	2	3	3	5	.....	.....	.....	1	.....	31
Pope	7	2	2	.....	3	3	3	2	1	.....	.....	.....	23
Ramsey	382	75	136	21	35	3	30	2	18	12	14	55	783
Red Lake	1	1	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	3
Redwood	11	.....	6	.....	1	.....	.....	.....	.....	.....	3	.....	22
Renville	9	.....	11	1	3	.....	5	1	.....	.....	.....	1	31
Rice	17	8	3	1	4	.....	6	2	.....	.....	1	1	42
Rock	3	.....	2	.....	1	.....	1	.....	.....	.....	2	1	10
Roseau	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1
St. Louis	55	30	26	8	5	1	7	8	5	2	4	1	152
Scott	7	.....	3	1	4	.....	3	.....	.....	.....	.....	2	20
Sherburne	.....	2	5	.....	.....	.....	2	.....	.....	.....	.....	.....	9
Sibley	3	2	4	.....	1	.....	.....	.....	.....	.....	.....	.....	11
Stearns	10	3	13	1	2	.....	7	1	2	.....	4	1	44
Steele	11	1	9	1	1	.....	.....	2	.....	.....	.....	.....	25
Stevens	.....	1	1	.....	.....	.....	1	.....	.....	.....	.....	.....	3
Swift	5	1	1	1	.....	.....	3	.....	.....	.....	.....	1	16
Todd	9	2	7	.....	1	.....	1	.....	.....	.....	1	1	22
Traverse	1	2	1	.....	2	.....	.....	.....	.....	.....	.....	.....	6
Wabasha	10	5	4	.....	3	.....	4	2	.....	.....	1	1	30
Wadena	2	1	.....	1	1	1	2	.....	1	.....	.....	.....	8
Waseca	10	1	4	.....	4	2	3	3	.....	.....	1	.....	28
Washington	26	1	5	.....	2	1	2	2	1	1	1	2	44
Watonwan	3	2	2	.....	.....	.....	2	.....	.....	.....	.....	.....	9
Wilkin	5	1	1	1	.....	.....	1	.....	.....	.....	.....	.....	9
Winona	13	3	4	.....	2	.....	6	.....	.....	.....	2	.....	30
Wright	16	4	9	2	.....	1	4	.....	.....	.....	.....	.....	36
Yellow Medicine	7	3	1	2	2	.....	3	3	.....	.....	.....	.....	21
Total	2,093	449	673	152	215	50	329	93	65	57	93	245	4,514
Grand Total													
Foreign Countries	11	14	8	.....	1	1	7	1	5	3	.....	5	56
States	245	63	51	19	53	12	39	11	10	6	16	85	610
Minnesota—Counties	2,093	449	673	152	215	50	329	93	65	57	93	245	4,514
Total	2,349	526	732	171	269	63	375	105	80	66	109	335	5,180

endeavor to bring the students into relation with the development of social and industrial organization, to provide special training for definite places in the social order. It must aid students in making intelligent choice of vocations and it must provide adequate training for those vocations. (3) It is hoped that the high standard set in the business courses and other vocational courses which may be established will have a favorable effect on scholarship in the College in general. (4) A twofold organization of the University needs to be worked out which will on the one hand secure administrative grouping with reference to the relationship and presentation of subject matter, and on the other hand will consider the contribution of each subject to the purposes of individual students and to separate vocations. This would require an organization of chairmen of department groups and directors of vocational education in a general committee with the President for University administration. (5) The serious problem of financial support demands the education of the people of the state to a realization of the need for increased funds if the University is to render the required service. If increased funds are not provided, the difficult problem of reducing the enrollment to the number of students that can be properly taught with the funds provided, must be faced.

The College of Engineering and Architecture.—(1) The number of students in the college has increased over 39 per cent during the past four years. (2) Scholarship requirements have been rigidly enforced, resulting in the dropping of 71 students, or 13½ per cent of the enrollment during the year. (3) Steps should be taken immediately to secure liberal appropriations from the Federal Government for courses in Military Engineering. (4) Fees have been increased from $50 to $60 a year to meet cost of increased instructional staff, intensified and specialized courses, etc. (5) New problems in research have been studied in the Experimental Engineering Department. (6) The need for a new Electrical Laboratory with equipment, and for apparatus for hydraulic experimentation at the High Dam is emphasized.

The Department of Agriculture.—(1) Changes in organization: Division of Entomology reorganized into Division of Economic Zoology with intercollege committee to coördinate courses and research work; similar committee organized for Plant Industry; Divisions of Animal Husbandry, Veterinary Science,

Dairy Husbandry, and Poultry brought together under name of Division of Dairy and Animal Husbandry; Agricultural Chemistry reorganized as Division of Agricultural Biochemistry; Division of Agricultural Education reorganized in conformity with the policy of centralizing responsibility for work in pure education in the College of Education, and closer working relations secured with the College of Education; special departmental committee created and director named for short course work; position of Assistant Director of the Experiment Station created; Graduate and Research Committee organized to supervise work of graduate students in research projects; unification of secretarial and record work and creation of office of Secretary to care for it; bookkeeping and budget work transferred to central University business office; (2) courses in Journalism offered under the direction of a "Division of Publications and Journalism"; plans for short course for editors made; (3) ninety-eight projects covering every important phase of agricultural research, experiment, demonstration, and survey under investigation during the year.

The Law School.—(1) Decrease of six in total registration; increase in first year class of twelve; (2) work of the Legal Aid Bureau developing rapidly; (3) special lecture courses given by Mr. Chas. W. Bunn, Hon. Frank B. Kellogg, Chief Justice Calvin L. Brown, Mr. C. D. O'Brien, Mr. Thomas D. O'Brien, Judge C. S. Jelley, and Mr. A. L. Helliwell; (4) satisfactory progress of instruction in practice in connection with the Legal Aid Bureau; (5) steady growth of the Law Library, 1,639 volumes having been added during the year; (6) need for a new Law Building, for additional library space and assistants emphasized.

The Medical School.—(1) Two divisions of clinical teaching organized as new departments of instruction—the Department of Pediatrics and the Department of Ophthalmology and Oto-Laryngology; (2) the Chiefs of these Departments and an additional faculty representative added to the Administrative Board; (3) entrance registration limited to 80 on account of inadequacy of hospital facilities; (4) 153 students registered in the summer session; (5) roof-house added to Service Building of the University Hospital provides quarters for the intern staff; (6) a Clinical and Pathological Conference instituted; (7) rule requiring each student of medicine to provide himself with an

approved microscope put in force; (8) School of Embalming conducted an eight-weeks session for 55 students; (9) in the University Hospitals 2,354 patients treated during the year at a daily average cost per patient of $1.44; (10) in the Out-Patient Department 12,325 new patients treated, 45,251 visits made, the daily average cost per patient being 25.9 cents per patient; (11) the Social Service Department during the year assisted 490 families; (12) need for nurses' home and for more adequate classrooms emphasized.

The College of Dentistry.—(1) First successful four-year course in Dentistry inaugurated; (2) notable results in research in Bacteriology and Pathology achieved in coöperation with members of the Department of Bacteriology and Pathology and of the Department of Medicine in the Medical School; (3) 75 students registered in the Summer School; (4) the College drew eight students from foreign countries during the year.

The School of Mines.—(1) New building occupied in September, 1915; (2) assurance given by the Secretary of the Interior and the Director of the Federal Bureau of Mines that Minnesota would be designated for one of three federal mining stations, the federal appropriation to be $25,000 a year, no part of which can be used for buildings and equipment, the Station to be located at the University of Minnesota and coöperation effected with the Minnesota School of Mines and the State Mining Experiment Station; (3) arrangements made for carrying on extensive tests of Eastern Mesabi magnetic ores, a special feature being the study of the best operating conditions for the magnetic log washer, a machine developed at the Minnesota Experiment Station; (4) coöperation with the Wisconsin Geological Survey in the investigation of low-grade ores of the Gogebic range and with the Minnesota Geological Survey on the titaniferous iron ore deposits of Cook and Lake counties; (5) investigation of manganiferous iron ores of the Cuyuna range and preparation of a bulletin; (6) plans prepared for new ore testing building in which suitably to house the Federal Bureau of Mines Experiment Station when the Government appropriation is available; (7) Bulletin No. 4, *Bibliography of Minnesota Mining and Geology* published and maps of the Iron Mining Districts of Minnesota brought up to date; (8) service rendered to Minnesota

Tax Commission; (9) needs: equipment for new building, completion of wing for Department of Geology and Mineralogy, new testing works and special equipment for coöperation with the Federal Bureau of Mines, assistance and apparatus for development of work in metallography.

The College of Pharmacy.—(1) Additional equipment added in dispensing laboratory; (2) 18,324 prescriptions dispensed by Free Dispensary Drug Room; (3) exhibits of medicinal plants and their pharmaceutical preparations and photographs in Philadelphia, Atlantic City, St. Paul, and Minneapolis; (4) inspection during the summer months for the State Board of Pharmacy of 186 drug stores and 42 general country stores.

The School of Chemistry.—(1) Substantial improvement made in the equipment of the General Laboratories; (2) considerable increase in the number of students in organic chemistry; (3) research laboratories equipped and occupied; (4) importance of industrial chemistry demands increased equipment; (5) notable increase in students registered in the School of Chemistry.

The College of Education.—(1) Third annual short course for Superintendents and Principals given with registration of 400; (2) responsibility for teacher training placed upon College of Education as the organ for the University; (3) recommendation of candidates for teaching positions made a University function administered by a central Bureau under a Senate Committee with an Executive Secretary; (4) important regulations governing the issuance of certificates worked out and adopted; (5) 49 positions filled through the Appointment Bureau; (6) important needs: departments for training commercial teachers and high school normal training, larger practice-teaching opportunities, and additions to staff and budget.

The Graduate School.—(1) Increase of registration from 237 to 376, or 58.6 per cent; (2) 55 degrees of Master of Arts and 7 degrees of Doctor of Philosophy conferred; (3) graduate medical work in connection with the Mayo Foundation progressing satisfactorily; (4) development of library and laboratory facilities and the strengthening of certain departments has increased opportunities for graduate study; (5) steady activity in the field of research and publication; (6) funds must be pro-

vided to secure and hold able and well-trained teachers, and to employ a large enough teaching staff to relieve men from excessive teaching duties and to give them time for research and scholarly work.

Report of the Dean of Women.—(1) The self-government associations have handled skilfully cases of conduct, and have carried out successfully plans for foreign and civic relief work; (2) the House Council has formulated and administered with energy and success simple but essential rules of conduct; (3) the ruling of the Pan-Hellenic Association that no freshmen shall be initiated who have failed to pass in all the hours of their work has had a stimulating effect on the scholarship of the sororities; (4) 76 lodging houses for women have been twice inspected by the resident nurse; (5) $635 have been lent to women students from the Woman's Loan Fund.

Agricultural Extension Division.—(1) Total budget from State and Federal Funds available for the year, $132,703.27; (2) publications distributed during the year: *University Farm Press News,* 24 issues, 3,500 copies each issue; *Farmers' Institute Annual* No. 28, on types and breeds of farm animals, 50,000 copies; *Farmers' Library*: "More and Better Acres of Corn for Minnesota," "Lighting Farm Buildings," "Cost of Producing Field Crops, 1908-1912," "House Heating," 75,000 copies each; reprints in editions of 25,000 each of "Seed Testing," "Alfalfa Growing in Minnesota," "Seed Potato Plot"; *Special Series*: "Bread-Making Contest," "Woodworking Exercises for the Agricultural School Shop," "Outline for Club Work," and "Quack Grass Eradication," 10,000 copies each, and "Standard Potato Varieties for Minnesota," 15,000 copies; (3) during the year, 75 regular Farmers' Institutes, 202 sessions, were held with a total attendance of 39,591; 453 special meetings, largely Farmers' Club meetings, were held with a total attendance of 39,591; (4) 28 regular five-day extension courses were held in as many towns, with a total attendance of 5,990; (5) under the direction of the division, 17 counties have continued county agent work with marked improvement; carefully worked out plans have been followed; a plan of farm bureau organization has been developed which secures the coöperation of all interested rural organizations; results accomplished: (a) alfalfa planting increased; (b)

1,300 soil acidity tests made in 13 counties in coöperation with the Soils Division; (c) remarkable increase of attention to livestock production; (d) marked reduction of hog cholera; (6) in coöperation with the County Agricultural Agents, farm management demonstrations have been carried on with 540 farmers in 11 counties; (7) in dairy extension work 22 cow testing associations with a total membership of 689 farmers have conducted tests of 8,100 cows; (8) 24 demonstration farms were operated under the supervision of the Division; (9) members of the Home Economics staff gave assistance at state and county fairs, at short course and farmers' club meetings and at Farmers' Institutes; (10) Farmers' Club organization has been pushed, there being now about 1,100 in the state; these clubs have been active in coöperative enterprises such as school improvement, coöperative creameries, elevators, livestock shipping associations, etc.; (11) large numbers of boys and girls in the Boys' and Girls' Clubs have participated in various agricultural contests such as corn and potato growing, canning and bread-making, etc.; (12) two rural plays have been presented in various communities.

General Extension Division.—(1) Evening classes in business, engineering, and collegiate academic subjects conducted in Minneapolis, St. Paul, Duluth, St. Cloud, Austin, Owatonna, Northfield, and Albert Lea; (2) two short courses for merchants were offered, one of a week's duration in January, the other of three weeks in February; (3) "University Weeks" visited 12 towns in May and June; (4) 95 per cent increase in enrollment in correspondence courses; (5) Lyceum and Lecture Department showed gratifying development; (6) 205 sets of lantern slides loaned to 80 towns; (7) commencement speakers and extension debaters were supplied to many communities; (8) 80 villages and cities made use of the services of the Municipal Reference Bureau; (9) a bi-monthly magazine, *Minnesota Municipalities,* devoted to a record of municipal progress, was circulated among the membership officials of the League of Minnesota Municipalities.

The Summer Session.—(1) Total enrollment, 1,067; (2) centralized consultation committee helped students in registering; (3) excursions to points of interest, lectures, chapel assemblies, and convocations added interest to the regular program of

studies; (4) more graduate courses were offered and there was an increase in the number of graduate students; (5) a check upon the attendance and scholarship of students was kept by the Chairman of the Administrative Board; (6) important recommendations: (a) the system of registration should be improved; (b) courses in physical education and opportunities for exercise should be provided for both men and women; (c) departmental libraries should be open to students; (d) the summer session should be lengthened; (e) a much increased budget is imperative; (f) control of the sessions of the various colleges should be centralized in the hands of the Director in order to secure coördination and uniformity and to avoid duplication of effort.

Physical Education for Men.—(1) Physical and medical examination given to all men students entering the University for the first time, and disease census cards filled out and filed; (2) required special lecture on sex hygiene given to 1,609 students; (3) Interfraternity Athletic Association organized; (4) chief recommendations: (a) a new gymnasium; (b) more ground for intramural sports.

Physical Education for Women.—(1) New building occupied; (2) 629 physical examinations of newly entering women students in all colleges; (3) 476 students registered for required exercise and 447 for elective; (4) recommendations: (a) that physical education requirements be extended to include the sophomore year; (b) that a professional training course in physical education leading to degree be offered.

Committee on Physical Education and Intramural Sports.—(1) Contests conducted under the direction of the Committee in football, tennis, basketball, handball, hockey, swimming, baseball, wrestling, and track athletics between classes, colleges, and fraternity groups; (2) athletic contests and games continued under the management of the Women's Athletic Association and with the coöperation of the Department of Physical Education for Women; (3) recommendations: (a) increased financial support for intramural sports; (b) increased space for football and baseball fields, tennis courts, etc., is urgently needed; (c) provision should be made for rowing as an intercollegiate and intramural sport.

Military Department.—(1) During the year, 1,648 cadets given instruction; (2) the first compulsory encampment held at

Fort Snelling, June 1 to 7 inclusive, with an attendance of 846; (3) as a result of the annual inspection by an officer of the United States Army, the University was for the third consecutive year placed in the distinguished class, which carries with it complete new equipment of the latest model to replace the obsolete equipment now being used; (4) a new armory is badly needed.

The Geological Survey.—(1) Coöperation continued with the U. S. Geological Survey, with the Federal Bureau of Mines in the investigation of peats in Minnesota, with the School of Mines Experiment Station, and with the School of Chemistry and the Division of Soils of the Department of Agriculture; (2) in cooperation with the U. S. Geological Survey, work completed on an investigation of the surface formations of Minnesota with special reference to the soils, maps have been engraved, and bulletins will be published; (3) an investigation of the peat deposits of Minnesota in coöperation with the U. S. Bureau of Mines and the U. S. Geological Survey completed; (4) in cooperation with the U. S. Geological Survey the survey of the geology and iron deposits of the Cuyuna Iron Range continued; (5) investigations of the magnetites of St. Louis, Lake, and Cook counties continued.

The Botanical Survey.—(1) Study of the origin and formation of the swamps and bogs of the state continued, a special study being made of the succession of plant populations in swamps and bogs, with especial reference to the permanence of grassland and woodland; (2) publications: fourth edition of the *Guide to Spring Flowers,* part 4 of volume 4 of *Minnesota Botanical Studies.*

The Library.—(1) Average annual expenditure for books, periodicals, and binding for the last five years, $40,203.49; (2) accessions during the past year, 23,418; this figure does not compare favorably with those of the leading universities; (3) war conditions have hampered the purchase of books and periodicals; (4) a list of serial sets available in the Twin Cities has been prepared for publication; (5) new Undergraduate Reading Room opened up for use in the old Chapel room; new stacks and hydraulic elevator installed; (6) collection of 5,000 maps loaned to the library by Mr. Andrew A. Benton, Law '95, of New York; (7) urgent need for a new library building reiterated.

The Academic Fraternities.—(1) Complete sanitary survey of all fraternity houses made under the direction of Dr. H. M. Bracken, Executive Officer of the State Board of Health shows that on the whole the fraternities are well housed; (2) slightly lower average of scholarship believed due to raising of requirements and standards of scholarship.

The General Alumni Association.—(1) In addition to the regular publication of the *Alumni Weekly*, a special number devoted to forensic contests from the beginning of the University was published; the Secretary has also been engaged in the preparation of material for a Handbook of Alumni work for the National Association of Alumni Secretaries; (2) the endowment fund has been increased during the year to $28,788.09; (3) assistance was given to R. L. Polk & Co. in the preparation of a complete alumni directory; (4) the constitution of the Association has been revised, the principal changes being the initiation of amendments by any fifty members, the letter ballot, and the election of ten directors at large.

PHYSICAL PLANT AND EQUIPMENT

Extension of Intercampus Line.—Largely out of funds available for use only on the University Farm Campus, the Board has authorized the building of a spur track from the main intercampus line to the cold storage plant at the University Farm. It is planned to purchase supplies of meat, vegetables, etc., in carload lots, to deliver these directly to the cold storage plant from which distribution will be made to the various dining halls, cafeterias, the University Hospital, etc. It is believed that this plan will enable the University to purchase more economically, and to utilize the cold storage plant effectively for the service of the whole institution.

Covering of the Northern Pacific tracks.—No real progress has been made in securing the covering of the Northern Pacific tracks through the campus since the report two years ago. This is due to the fact that the litigation referred to in the report of two years ago, involving the validity of an ordinance passed by the City Council of a nature similar to the ordinance passed regulating the depression of the Northern Pacific track on the East Side, but relating to the lowering of the Chicago and Milwaukee

tracks in South Minneapolis, was declared in part invalid by a decision of the Federal Court, Judge Booth writing the opinion. Since that decision was rendered, efforts have been made to draft a new ordinance which, it is hoped, will stand the test of the courts; and a committee of the Board of Regents has interviewed the Aldermen of the Second Ward, in which the University is situated, and urged them in the drafting of a new ordinance so to modify if possible the ordinance now in force in southeast Minneapolis as to permit the covering of the tracks in the campus without delay or litigation. This subject is now pending before the Council.

The Mississippi water-power project.—December 14, 1915, the Board of Regents voted to join with the cities of Minneapolis and St. Paul in a resolution pledging the support of the University of Minnesota to the Municipal Electric Company in its efforts to secure from the Federal Government a franchise to operate an electric power-plant in connection with the water-power created by the building of the new dam in the Mississippi River near the mouth of Minnehaha Creek. Engineers estimate that the power available would meet all future needs of the University, and would go far toward supplying current for municipal purposes in both cities.

FINANCES

Survey of the Business Office.—Not only has the Public Examiner devoted a large amount of time to a detailed examination of the business affairs of the University, but two expert accountants independently employed by the Board of Regents have made special surveys of the Business Office, and the whole fiscal administration of the institution. The reports have been gratifying. The details will be found in the *Nineteenth Biennial Report,* (pp. 78-80).

Sundry business items.—The so-called Salt Springs Lands belonging to the University have been examined and reported upon by an expert. Regulations with regard to University transactions with administrative officers have been adopted by the Board of Regents. Various changes in the law with a view to improving business efficiency have been, on the recommendation of the Comptroller, urged upon the Legislature by the Board of

Regents. The sums appropriated to the University of Minnesota by the Federal Government have largely increased during the last six years. Detailed discussion of these topics will be found in the *Nineteenth Biennial Report,* (pp. 83-84).

Changes in fees.—In the spring of 1916 the Regents, in order to meet the problem of congestion in certain colleges, authorized an increase in fees of five dollars per semester in the Colleges of Arts, Agriculture, Education, and Engineering, the change to become effective August 1, 1916. On the recommendation of the College of Dentistry the fees for the first two years of the three-year course or the second and third years of the four-year course were increased from $150 to $175 per annum. Minor increases in charges for board and dormitory accommodations at the Schools of Agriculture were also authorized.

Reorganization of the University Storehouse.—The plan to purchase supplies in large quantities, to store these in a central place, and to distribute them on requisitions from departments has steadily advanced. The value of goods handled in 1915 was $37,019. In 1916 this amount rose to $107,860. The service has also increased rapidly in efficiency. Deliveries are being made promptly, and the delays incident to a decentralized method have rapidly disappeared. There is ground, too, for believing that the cost of administration has been more than offset by the economy of purchasing in large quantities.

THE GENERAL SITUATION

The problems and needs of the University have been set forth in detail in the *Nineteenth Biennial Report* of the Regents to the Legislature. Increase of salaries, enlargement of the teaching staff, the introduction of new courses, provision for rapidly rising costs of supplies are vitally necessary if the institution is to maintain respectable standards of teaching and respond to the new demands which the community is making for specialized training in several fields of economic and social activity.

Respectfully submitted,

GEORGE E. VINCENT, *President*

THE COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

To the President of the University:

SIR: I submit herewith my report for the year 1915-16.

The following changes occurred in the professorial ranks of the faculty:

Resignations.—Alois F. Kovarik, Associate Professor of Physics, resigned to accept a position in Yale University.

Leaves of absence.—Frank F. Grout, Assistant Professor of Geology and Mineralogy, David F. Swenson, Associate Professor of Philosophy, and Anthony Zeleny, Professor of Physics, were absent on sabbatical leave for the year; and Guy Stanton Ford, Professor of History, for the second semester.

Appointments.—Carl Lotus Becker, Professor of History; Rupert C. Lodge, Assistant Professor of Philosophy; Joseph Peterson, Assistant Professor of Psychology.

Enrollment.—The enrollment in the college for 1915-16 was as follows:

	MEN	WOMEN	TOTAL
Seniors	81	191	272
Juniors	148	213	361
Sophomores	310	246	556
Freshmen	496	384	880
Unclassed	54	226	280
	1,089	1,260	2,349
Registered in other colleges and taking work in this college equivalent to			566
			2,915

Faculty.—The faculty consisted of thirty-three professors, five associate professors, twenty-six assistant professors, two professorial lecturers, forty-nine instructors, and assistants and part-time teachers to the equivalent of seventeen full-time instructors. For this purpose only those are counted who were actually present and teaching, not those who were on leave of absence.

Educational policies.—The conditions of higher education in this country have produced serious problems for the Arts College, and some of these are especially difficult in the State of Minnesota. In recent years the enrollment in high schools and colleges has increased much more rapidly than the population. People are better able to send their children to college and more people desire a college education. Meantime specialization has gone forward in every sphere of life and special vocational training is expected in the colleges.

While the people of the state are demanding this higher education, they have not paid the cost. For the two years 1913-14 to 1915-16 the

enrollment in the Arts College increased 47.5 per cent, while the total funds of the college increased 3.4 per cent. As a measure of relief an increase of fees was decided on for the year 1916-17.

Under these conditions questions as to the function or duty of the Arts College, as to scholarship, and as to organization affecting the college and the whole University, become serious problems pressing for attention.

Since the general recognition of the elective system of studies in the early eighties, Arts colleges first tried to extend and widen the opportunities for higher education by offering more numerous and varied courses of study. Later they have tried to secure intellectual discipline and coherence of plan in the student's studies by means of systems of regulations providing for specialization, grouping of studies, distribution of work, et cetera. These educational plans have not brought the work of the college into relation with the movements in social and industrial organization.

The college has aimed to provide an intellectual discipline and culture which shall give its graduates a general readiness for their duties in life. The interest of society demands special training for definite places in the social order and some means of helping youth to find what places they can fill best. The college must be judged—as are its graduates—by the value of the contribution made to social processes. All the work of the college—whether informational, disciplinary, or cultural—has its vocational aspect. It discharges a definite function in society because its individual graduates enter specific employments and the work of the college derives its value from the adequacy of their preparation.

The recognition of this view of the function of the college will bring to bear the most powerful incentive to efficient work on the part of the students. The dominating factor in education is purpose, not merely intellectual interest or emotional enjoyment of present objects. The vision of the distant aim, the image of a satisfying activity, holds the chief place in stimulating and directing present effort. The college will succeed in its work, then, in proportion as its students bring with them or find here a definite and compelling purpose in their college life. One of the clear-cut problems before the college, therefore, is how to enable its students to make intelligent choice of vocations and how to give them adequate training for those vocations.

In the year 1913-14 the faculty voted to undertake vocational training and in 1914-15 students were admitted to a four-year course in business education. Plans for other vocational courses were also discussed but action postponed until financial support could be obtained.

Closely bound up with the great increase in students and with the plans for vocational training is the problem of maintaining our standards and improving scholarship among our students. A small number of students have enrolled in the honors course, which was first offered in 1914-15, but this course has not yet been before the students long enough to show to what extent it will prove attractive to the best class of students. The faculty has set a standard of scholarship in the business course

higher than the average of student standings. If the same policy is followed in other vocational courses, there will be created in these and the honors course a considerable body of students whose interests and serious work will have a favorable effect on scholarship in the college in general. Further plans regarding methods of teaching and the management of our large student body must be determined largely by the adequacy of the financial support which the State will furnish. Thoro revision of curriculum requirements will be carried out gradually.

A third set of problems, administrative in character, are also intimately related to vocational education and the aims of scholarship. These are the questions of University organization with reference to the interests of students and state and to efficiency and economy within the institution. Students desiring training for specific purposes often desire to combine work in two or more colleges. Questions frequently arise as to the delimitation of work between departments concerned with the scientific or cultural aspect and those concerned with the practical or applied aspect of the same subject. Adjustments are constantly being made through the laborious processes of conference committees and reports to Deans and President or through Senate action. Conferences have been organized with standing committees and arrangements for periodical readjustment of courses of study and other relations in the case of the Departments of Animal Biology, Anatomy, and Physiology; Animal Biology and Economic Zoology; Botany and Plant Pathology and other departments interested in plant industries; the several departments of Mathematics so far as graduate work is concerned.

While the spirit of coöperation which has led to these permanent conference arrangements is excellent, the whole question of the adequacy and adaptability of the organization of the University by colleges should be given careful consideration. Two points of view will present themselves: organization with reference to subjects and methods of teaching, and organization with reference to the purposes to be served. The first or educational view-point suggests that departments, each in charge of a well-recognized and limited subject, should be grouped in accordance with the natural relations of those subjects and for the purpose of clear and correlated presentation of the subjects. The second or vocational view-point gives prominence to the administrative and educational advantages of organization for the sake of the ends to be gained. Neither point of view can be adopted independently of the other if the duties of the University as a whole to the community be held in mind. The same subjects contribute to various purposes and a twofold organization will be necessary. Departments should be grouped with reference to relationship of subject matter and at the same time the contribution of each subject to certain purposes or vocations should be arranged by vocational directors. There would then be required some method of bringing together the chairmen of department groups and the directors of vocational education in a general committee with the President for University administration.

Finally, I wish to suggest that the very serious problem of financial support which has arisen from the great growth of the college, should be attacked by way of educating the people of the state, entirely apart from any legislature or any political campaign, to understand what the University is doing and what continued opportunities for higher education for all youth of the state must mean in the way of financial support through increased taxation. The University owes it to the people of the state to furnish this information entirely apart from the presentation of the budget to any particular legislature. In case adequate support for general education is not forthcoming we should be ready to adopt measures that will reduce the enrollment to the number of students that can be properly taught with the funds provided, and to select the most capable students for instruction. To work out the machinery for this will be a most intricate and difficult problem. The high schools do not offer satisfactory conditions for the selection of students for higher education. It is most desirable that a part of the selection at least should be made after the students have worked for a period in the University. Examinations, mental tests, and personal interviews might be made the basis for selection of the number of matriculants admitted to the freshman class. Thereafter, students in the freshman year and later would have to be dropped from the bottom of the classes so far as necessary to keep the numbers within the limits set by the college budget. In any event I must urge that the faculty and equipment should be devoted to the full development of the powers of each student. This means vocational guidance and special provision (far beyond anything heretofore attempted) of exceptional work and facilities for the exceptionally strong student.

Respectfully submitted,

J. B. JOHNSTON, *Dean*

THE COLLEGE OF ENGINEERING AND ARCHITECTURE

To the President of the University:

SIR: I have the honor to submit my report for the college year 1915-16.

The growth of the College.—In my report of 1911-12 a brief historical sketch of the beginnings of the College prefaced the more recent development; and my subsequent annual reports have sketched the progress of each year, showing our expanding student body, our wider range of courses, our ampler instructional staff, better equipment, and more adequate and wholesome quarters. The year 1915-16 has continued and intensified the betterment which has gathered momentum since 1912-13. While the College has a threefold purpose as an instrumentality of the State, expert counselling in engineering matters, contributing to the advance in technical soundness and facility by research, and teaching the youth of the nation, the last is the dominating purpose. The increase in the numbers of the students enrolled in the College, notwithstanding most stringent scholarship requirements, is therefore a measure of the service rendered and the fulfillment of purpose. In the year 1911-12 only 378 students were enrolled; in the past year 526 was the registration, an increase of over 39 per cent in four years. Of the students of the past year, 449, or more than 85 per cent, are from the state; 63, or 11.7 per cent, are from other parts of the United States; while 14 students, less than 3 per cent, are from foreign countries, Canada, China, Cuba, Greece, Japan, Norway, and Siberia.

Scholarship requirements.—The wholesome growth in the student body is all the more gratifying in view of the fact that up to the second semester of the past year the privilege of continued attendance, the right to have expended upon him each year something over three hundred dollars of the money of the people of the state, was won by the student himself by such efficient accomplishment of his tasks, as gave assurance that the investment of public funds would result in an economic benefit to the state. The rules of the College were stringent and were enforced. During the year 71 students, 13½ per cent of the enrollment, were dropped for unsatisfactory scholarship. The resentment growing out of individual cases of elimination made the softening of the ironclad rule appear wise, and in some cases transfers to other colleges was the remedy applied.

Perhaps the youth of Minnesota are as virile as those of any state in the Union, and the men of the College of Engineering are as manly as those of West Point. Men who elect engineering are in training as commissioned officers in great industrial undertakings, as cadets at West Point are in training for great military undertakings. Emerson's sibilant "soldiers, sea captains, and civil engineers" expresses the kinship of men

whose lives are devoted to hardy things. It is not best that men in training in a college of engineering be as leniently governed as we might wish our daughters to be in a seminary. The maintenance of rigid scholarship rules is believed to work for the upbuilding of the best type of engineer and architect.

Military Engineering.—Steps should be immediately taken by the University, as a land-grant institution, to secure liberal appropriations from the Federal Government to make it practicable for students taking engineering courses to fit themselves as Officers of the Line, the Ordnance, or the Engineers. This would involve: Military Drill through the full four or five years of the course, including special detail to military service for each summer vacation, the securing of a Bachelor's degree in Engineering, with some electives permitted in Military Engineering, the science of war or in International, Military, or Constitutional Law; a fifth year of study specifically devoted to those subjects which fit men to serve efficiently as officers of the Corps of Engineers or of the Ordnance. For students not working for appointments to the Engineers or to the Ordnance, the fifth year may not need to be taken. The war now on is demonstrating the need of engineering training for war. In what degree are the successes of the Teutonic forces on land attributable to engineering design in the machines and munitions of war, to railways, automobiles, aeroplanes, earthwork trenches and concrete galleries, rebuilt bridges, and accurate map work? The newspapers state that the designer of the famous 42-centimeter Krupp gun has been given the degree of Doctor of Engineering *honoris causa* by the Technical Academy at Karlsruhe. The machines of peace in our manufactories are not very different from the machines of war. The gas engine and the machine gun are of kin. The telegraph, the telephone, and the wireless do not distinguish between messages of peace and messages of war. The sanitation of a city, a canal zone, and a camp follow the same principles and similar practices. To move a wheat crop and to provision and munition an army are not dissimilar transportation problems. The triangulation and topographic surveys of military positions are not unlike those made to design irrigation systems. To make of our young engineers now training in the great technical schools of the country, or the best of them, officers to be called to the colors in the country's possible need appears wise Federal policy. To secure for our best students Federal subsidy to help pay for this technical education appears wise state policy. The state will be warranted in adding specialists in Military Engineering to the Faculty. At West Point the cadets, the students, are paid something over $700 a year and living expenses for educating themselves as officers of the Army. A similar amount paid our engineering students or selected individuals of the student body to secure military training in parallelism with engineering training will be a benefit to the student, the state, and the nation.

Increase in fees.—With the growth of the College in student numbers, in instructional staff, in more intensified and specialized courses, in

the equipment of laboratories and library, and in adequate buildings, the budget of the College has increased in a larger percentage necessarily than the student numbers. During the year 1915-16 the fees of the College were increased, beginning in 1916-17, from $50 a year to $60 a year. This tends to the assumption of a larger portion of the cost of his professional training by the student benefited or by his people. In the majority of cases this has worked no hardship. With a liberal and discriminating allotment of free scholarships the larger fee is fully justified.

Faculty changes.—The following promotions in rank have been made: Mr. R. C. Jones and Mr. F. R. McMillan from the rank of Instructor to that of Assistant Professor. The following appointments were made: Mr. J. H. Forsythe and Mr. S. C. Burton as Instructors in the Department of Architecture; Mr. E. A. Reid as Instructor in the Department of Electrical Engineering; Mr. Charles H. Blitman as Instructor in the Department of Drawing and Descriptive Geometry; Mr. E. Dow Gilman as instructor in the Department of Experimental Engineering; and Mr. J. B. Frear and Mr. J. S. Turner as Instructors in the Department of Mathematics and Mechanics. The following resigned: Mr. F. K. Cowley and Mr. L. B. Walton in the Department of Architecture; Mr. I. Kvitrud in the Department of Drawing and Descriptive Geometry, and Dr. W. L. Miser in the Department of Mathematics and Mechanics.

Buildings and equipment.—No large changes have been made in quarters. Equipment has been added to in small ways in the Electrical Laboratory, the Shops, the Experimental Laboratory, and in the Architectural rooms.

Curriculum.—The courses of study were changed somewhat fundamentally, bringing in specific engineering applications in the earlier years. The course in General Engineering for manufacturers, contractors, and administrators was developed.

Architecture.—The course in Architecture was offered in the full four years leading to the Bachelor's degree and four students were graduated. The number of students enrolled in Architecture was 70. Life classes for senior students were held at the Minneapolis Institute of Fine Arts. In recognition of the maturity and importance of the Department of Architecture the name of the College has been changed to the College of Engineering and Architecture.

Research.—Several new problems have been undertaken and some of the problems which were reported last year are being continued. No bulletins have been issued this year. In the Experimental Department the following investigations are being carried on: The study of the development of the Experimental Department which was begun by Professor Kavanaugh is being continued by Professor Shoop, shrinkage and time effects in concrete by Mr. McMillan, the effects of moisture on the modulus of elasticity in concrete by Mr. Lagaard, study of the gravels of Hennepin and Ramsey Counties by Mr. Gilman. In the Department of Mathematics and Mechanics Professors Brooke and Newkirk have been

working on a text on Technical Mechanics; in the Civil Department Professor Meyer has prepared a book on Hydrology, while Professor Parcel and Mr. Maney are making a study of secondary stresses in long-span bridges. In the Mechanical Department Professor Flather is making a study of the velocity of gases in chimneys. Professor Ryan in the Electrical Department made an investigation of the diversity factors in Minnesota central stations for electric light and power and this has been published. Mr. Turner also of the Electrical Department made an investigation of air cored transformers.

Night classes.—Courses in Engineering and Architecture have continued to be given under the direction of the Extension Division of the University. These courses do not give credit towards degrees in the College. See the Report of the Director of Extension.

Statistics.—In Tables I, II, and III forming part of this report statistics are presented of the registration in the College for the years 1873-1916, of scholarship, and of the geographical distribution for the past year.

Recommendations.—Salaries in the College should be placed upon a more adequate basis, and increased instructional force must meet the expanding student numbers.

The need of a new modern Electrical Laboratory with equipment must again be emphasized. Not less than $5,000 should be made available for apparatus for hydraulic experimentation at the High Dam. The Experimental Laboratory should be provided with additional equipment. The library of the College needs expansion.

Special detailed reports will be submitted defining the needs in Electrical Building, High Dam apparatus; equipment for Experimental Laboratory, Architecture, and the Shops of the College.

TABLE I. REGISTRATION IN THE COLLEGE, 1873-1916

Year	No.	Year	No.	Year	No.
1873-74	4	1888-89	25	1902-03	371
1874-75	7	1889-90	33	1903-04	395
1875-76	4	1890-91	74	1904-05	399
1876-77	3	1891-92	78	1905-06	412
1877-78	5	1892-93	154	1906-07	458
1878-79	3	1893-94	147	1907-08	473
1879-80	2	1894-95	149	1908-09	467
1880-81	2	1895-96	201	1909-10	407
1881-82	9	1896-97	186	1910-11	420
1882-83	15	1897-98*	129	1911-12	378
1883-84	8	1898-99	143	1912-13	393
1884-85	7	1899-1900	195	1913-14	438
1885-86	None	1900-01	246	1914-15	475
1886-87	15	1901-02	312	1915-16	526
1887-88	28				
Total					8,196

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

TABLE II. SCHOLARSHIP STATISTICS, 1915-1916

1. Total number of students	526
2. Number of conditions	361
3. Number of failures	361
4. Number of students dropped	72*
5. Number of students cancelled	28

* One student out of this number was suspended for one year on account of irregularity in examination.

TABLE III. GEOGRAPHICAL DISTRIBUTION OF STUDENTS

DISTRIBUTION BY COUNTIES IN MINNESOTA

County	No.	County	No.	County	No.
Anoka	2	Itasca	1	Redwood	1
Becker	1	Jackson	2	Rice	8
Beltrami	3	Kanabec	1	Roseau	1
Benton	1	Kandiyohi	5	St. Louis	30
Blue Earth	5	Lac qui Parle	2	Sherburne	2
Brown	2	Lake	2	Sibley	2
Carlton	2	Le Sueur	2	Stearns	3
Chippewa	2	Lyon	1	Steele	1
Chisago	1	McLeod	1	Stevens	1
Clay	3	Martin	1	Swift	5
Crow Wing	3	Meeker	3	Todd	2
Dakota	3	Mille Lacs	4	Traverse	2
Dodge	1	Morrison	1	Wabasha	5
Douglas	1	Mower	4	Wadena	1
Faribault	2	Murray	1	Waseca	1
Fillmore	6	Nobles	3	Washington	1
Freeborn	1	Olmsted	2	Watonwan	2
Goodhue	7	Pipestone	2	Wilkin	1
Grant	1	Polk	2	Winona	7
Hennepin	203	Pope	2	Wright	4
Houston	1	Ramsey	75	Yellow Medicine	3
Isanti	1	Red Lake	1		
Total					449

DISTRIBUTION IN OTHER STATES

States	No.	States	No.	States	No.
District of Columbia	2	Massachusetts	1	Ohio	1
Idaho	1	Michigan	6	South Dakota	8
Illinois	4	Missouri	2	Washington	1
Indiana	2	Montana	5	Wisconsin	10
Iowa	9	North Dakota	11		
Total					63

DISTRIBUTION OUTSIDE OF UNITED STATES

Country	No.	Country	No.	Country	No.
Canada	6	Greece	1	Norway	2
China	2	Japan	1	Siberia	1
Cuba	1				
Total					14

Aggregate registration..... 526 Gain over last year..... 51

Note: This distribution shows the student body made up of 85 per cent Minnesota men.

Respectfully submitted,

FRANCIS C. SHENEHON, *Dean*

THE DEPARTMENT OF AGRICULTURE

To the President of the University:

SIR: I submit herewith the report of the Department of Agriculture for the year ending July 31, 1916.

ORGANIZATION

The general plan of organization described in previous reports has given increasing evidence of its soundness and is proving highly efficient in developing a democratic spirit with a realization of personal responsibility and accountability, and at the same time securing the fullest cooperation of all the members of the various educational research, administrative, and business staffs.

Changes in Department Staff.—Only a few important changes have been made in the Station staff. Dr. H. P. Hoskins, who was in charge of our hog cholera serum manufacture, has accepted a position as pathologist with the Parke-Davis Company of Detroit, Michigan. Dr. J. T. E. Dinwoodie, who assisted him, has accepted a position in the extension service of the South Dakota Agricultural College. Neither of these positions has as yet been filled. In connection with the reorganization of the animal husbandry work, Dr. Carl W. Gay of the University of Pennsylvania, was appointed Chairman of the Division of Animal Husbandry and Chairman of the Animal Industry Group. Professor H. H. Kildee of Ames, Iowa, was appointed Chairman of the Division of Dairy Husbandry. Frank Robotka was appointed Assistant in Accounting in the Division of Economics, in coöperation with the Office of Markets of the National Department of Agriculture. L. G. Hood has been appointed Assistant Editor and G. R. Bisby, Assistant in Pathology. Miss Lucile Wheeler, Assistant Professor of Textiles and Clothing resigned and Miss Alice L. Thomas was appointed to her position.

Economic Zoology.—In accordance with this plan, the old division of Entomology was reorganized into the Division of Economic Zoology with the following sections: Economic Vertebrate Zoology, Economic Entomology, Parisitology, and Research in Economic Zoology. Professor F. L. Washburn, chief of the old division of Entomology was appointed chairman of the reorganized division for the year. In order to bring about the fullest coöperation of all workers in zoology in the University, workers interested in the subject in other colleges were invited to a conference, and an intercollege committee was formed to coördinate courses and research work. This committee has been active and their recommendations have been adopted. It is planned to have meetings as frequently as necessary to secure the fullest coöperation.

Plant Industry.—A similar conference was organized for all of the branches of the University dealing with plant industry—Agricultural

Botany and Plant Pathology, General Botany, Horticulture, and Agronomy.

Animal Industry.—Plans were perfected during the year for bringing into much closer relation the various divisions dealing with Animal Industry. The first step in this direction was taken in 1911, when the separate divisions of Animal Husbandry, Dairy Husbandry, and Poultry were brought together under the name of Dairy and Animal Husbandry with Professor T. L. Haecker as chairman. Each group was divided into appropriate sections. The plan has been so successful that it was decided further to perfect the organization by bringing in Veterinary Science. Neither Animal Husbandry nor Veterinary Science can develop properly and do the best work separately. Working together they should give a great impetus to the cause of Animal Industry, which is at the foundation of progressive agriculture.

Horticulture.—A slight change was made in the Division of Horticulture upon recommendation of the divisional staff in making the position of chairman *appointive* instead of *elective*.

Agricultural Biochemistry.—In order more clearly to define the work of the old Division of Agricultural Chemistry and to distinguish its field from that of the School of Chemistry and the chemical work of the Division of Soils, it was reorganized as the Division of Agricultural Biochemistry with the following sections: Section of Plant Chemistry; Section of Biochemical Research; Section of Cereal Technology, and Section of Agricultural Analysis. The Division will as heretofore cooperate with all divisions that need assistance in chemical work.

Home Economics.—The following sections were recognized during the year: College—Section of Nutrition, Section of Foods and Cookery, Section of Textiles and Clothing, Section of Drawing and Design; School—Section of Foods-Management, and Section of Textiles and Clothing.

Agricultural Education.—Some important changes were made in the Division of Agricultural Education in conformity with the policy of centralizing responsibility for work in pure education in the College of Education. All of this work was transferred to that college. Most of it, however, will be given on the Agricultural campus as heretofore. A much closer working relation is thus secured between the College of Agriculture and the College of Education.

Short Course Director.—As described in another part of this report the Short Course work has reached such a volume that it has been necessary to provide especially for it. The work is handled by a special departmental committee of which Professor A. V. Storm is chairman. His relation to the work has been still further recognized by making him Director of Short Courses.

Assistant Director of the Experiment Station.—Considerable progress was made during the year in further segregating and organizing the work of the Experiment Station. With increasing government coöperation and more stringent regulations governing the expenditure of the

money appropriated to this work by the general Government, it has become necessary to maintain a much closer administrative touch with it. In order to accomplish this, Professor R. W. Thatcher, formerly Secretary of the Station Staff, has been made Assistant Director.

Graduate and Research Committee.—The policy of utilizing qualified graduate students in some of the research projects of the Experiment Station has proved of benefit to both the Station and the Graduate School. A very high grade of assistance can thus be secured at comparatively small expense. It is necessary, however, to keep the practice under very strict control and supervision. To accomplish this, a research committee, with the Assistant Director as chairman, was organized to handle all such cases with the graduate committee representing the College of Agriculture and the Graduate School.

Office of Secretary.—An important step was taken during the year in the unification of the registration offices of the School and Colleges of Agriculture and Forestry, educational statistics, College, School, and Station Staff secretaries and other general secretarial and record work. The office of Secretary of the Department was created to handle these duties. Associate Professor R. M. West was appointed by the Regents as Secretary. The reorganization has proved to be highly efficient and satisfactory from every standpoint.

Business Office.—A further consolidation and unification of the business offices was accomplished by transferring our bookkeeper to the central office as general bookkeeper, and our budget clerk to the central office as general budget clerk. Their skill and experience in these lines were thus made available for the whole University. While the change has considerably increased the work of the various divisional and administrative clerks on this campus the gain on the part of the University as a whole more than offsets the extra work here.

Division of Publications and Journalism.—Because of the parallel interest of the press of the state and of the Department of Agriculture of the University of Minnesota in agriculture as the basic industry of the state, the Department of Agriculture early in 1915 proposed to offer courses in Journalism. It believed that by so doing it could bring into closer relationship for the betterment of agriculture and rural life, the press and the Agricultural Department of the University, and could equip its students for more efficient service by familiarizing them with ways and means of coöperating with newspaper publishers. A practical course in news-gathering and news-writing was offered under the direction of the Division of Publications and Journalism at the opening of the second semester of the year 1914-15.

Steady progress in two directions has been made in journalism since then. The increasing demand of students for opportunity to study journalism has been met with courses adequate to their immediate needs, and the newspaper publishers of the state and the Department of Agriculture have been drawn into closer relationship. Evidence of the latter is seen in the fact that last February the Minnesota Editorial Association

asked the Division of Publications and Journalism to coöperate in solving some of the problems of the publishing business in Minnesota, which ranks fifth among the industries of the state.

Ten students registered for the course in news-gathering and news-writing offered in February, 1915, tho the course was announced only a short time in advance of the semester's opening. Twenty students registered for a similar course at the beginning of the year 1915-16. Most of these students continued their work through the year, giving required time to practical work as members of the staff of the *Minnesota Daily*, and seven supplemented this course by a course in newspaper administration offered in the second semester of the same year. For a course in agricultural journalism, offered at the College of Agriculture in the second semester of the year 1915-16, twenty registered. To enable the Division of Publications and Journalism to carry the additional work, an instructor in journalism was employed.

Calls from publishers for young men to take positions in newspaper and periodical offices began coming in almost as soon as courses in journalism were offered, and these have increased in frequency.

Work for the year 1916-17 includes five courses: news-gathering and reporting, copy-reading and headline-writing, and editorial-writing. The *Minnesota Farm Review*, a monthly publication of the alumni of the School of Agriculture, will be converted into a weekly for laboratory practice on the part of students of the College of Agriculture. As the work of the Division develops, more and more use will be made of the University's printing plant, also, as a laboratory in the art and mechanics of the publishing business.

The call for coöperation with the publishers of the state was expressed in a resolution adopted at the 1916 meeting of the Minnesota Editorial Association. The resolution asked that the Division make a survey of the publishing business of the state, the information gathered to be placed at the disposal of a committee appointed to formulate a plan for an advertising bureau as an auxiliary of the Editorial Association. The survey is now being made, with promises of excellent results.

In addition to this, the Division has voluntarily prepared a style book, to be published by the University as a piece of extension service and sent out to the editors of the state for distribution among their correspondents. The manuscript has been submitted to the members of the Executive Committee of the Minnesota Editorial Association and has been unanimously approved.

Again, a member of the staff has worked a large part of his time since the close of the University in June on a simplified cost-accounting system which will be made available to all of the newspapers of the state.

Plans for a short course for editors are also taking shape. Such courses are being offered by the universities of other states, and there

is a demand for such a course in Minnesota. Several editors have made personal requests for such a course and others have expressed their opinions in favor of one in editorials.

All of these activities have been asked for by the editors of the state, and the head of the Division of Publications and Journalism is a member of a committee appointed by the Minnesota Editorial Association to formulate a plan of affiliation between the printers' and publishers' organizations of the state and the University for the promotion of such work as has been mentioned.

Growth has been marked in the publication and distribution of bulletins and other material by the Division. Four new bulletins in the *Farmers' Library* Series of the Agricultural Extension Division were edited and printed in editions aggregating 290,000. Three reprints of the same series were issued in editions amounting to 75,000. Five bulletins of the *Special Series* of the Agricultural Extension Division were made ready for distribution in editions of 10,000 each. Nine new *Experiment Station Bulletins* were also edited and published and a reprint of one such bulletin was made in addition to the Annual Report of the Director. The aggregate of the Station Bulletins and Annual Report was 101,500. The new *Farmers' Library Bulletins* issued were sent out to persons on the extension mailing list which contains more than 55,000 names. Bulletins in the *Special Series* of the Agricultural Extension Division are used to meet unusual conditions, and some of those issued were distributed largely in particular communities in order to foster some special local work. Each of the *Experiment Station Bulletins* was sent to persons especially interested in its subject matter according to lists in the Office of Publications, and also to a general list of persons wishing all of the Station Bulletins. Altogether, approximately 450,000 bulletins were distributed during the year—280,000 of these being new bulletins and 170,000 being new and old bulletins sent out in answer to special requests.

The Division of Publications has edited, and written largely, the *University Farm Press News,* issued twice a month throughout the year and distributed among the newspapers, banks, libraries, and other institutions of the state. It has edited *The Visitor,* a monthly publication of the Division of Agricultural Education. It has edited and superintended the publishing of numerous bulletins of other series than those named, issued to advertise the various short courses offered by the Department of Agriculture. Furthermore, it has prepared and attended to the distribution of a large amount of publicity matter sent to the daily newspapers, the weekly newspapers, and the agricultural press, and very freely used by the three classes of papers. Moreover, during the year the office has looked after all of the mimeographing of the Department, amounting to 225,000 printed sheets. The Division of Publications and Journalism is also frequently called upon to assist in revising manuscripts prepared by members of other divisions for the press.

THE EXPERIMENT STATION

THE CENTRAL STATION

During the year, the organization of all of the work of the Station into projects was completed. This means that all Station work of every kind is definitely formulated into projects, which must be approved by the Director before work upon them is undertaken. An annual report of progress on each project, showing the results accomplished, the estimated expenditures in connection with the project, and the plans for the coming year, is presented once each year.

There were in progress during the past year, in all of the twelve Divisions of the Station, a total of 98 projects. Of these, 51 are classed as research (investigations of fundamental principles of agricultural science); 24 as experimental (studies of the application of scientific principles to local farm problems, variety testing, comparison of methods of analysis or testing, etc.); 8 as demonstrational; and 15 as survey or regulatory work.

A summary of the results of all this work is presented in the *Twenty-fourth Annual Report of the Experiment Station.* The following is a brief statement of some of the more important and far reaching results which were obtained during the past year.

The investigations of the nutrient value of feeding stuffs for beef-production, which have been in progress for seven years, were brought to a conclusion so far as they relate to beef-bred steers, and a report showing the amount of each of the different classes of food constituents required to produce a pound of gain in weight, and the cost of these under ordinary market conditions, was published. Other important phases of the work are being prepared for publication. The investigations will be continued, using dairy-bred steers, and will be extended to include pork production.

Investigations of the possibility of using certain easily volatile organic chemicals as insecticides resulted in the discovery that a hitherto unused compound, nitrobenzene, is a much safer and more efficient fumigant for insects than any substance now in use for this purpose, and that other allied benzene derivatives possess very important insecticidal, fungicidal, or stimulating effects. The results of this work will undoubtedly completely revolutionize methods of fumigation against insects and will probably introduce many improved methods of spraying or otherwise combating insect pests and of stimulating plant growth.

The appearance of the dreaded white-pine blister rust in this state led to the inauguration of an immediate and vigorous campaign for its eradication. Every known source of infection was destroyed and a systematic search of surrounding forests for new infection is in progress.

The breeding of wheats for resistance to black rust has resulted in the development of several new strains which are highly resistant to the disease and possess good milling qualities, a combination which had not hitherto been successfully attained. Studies of the chemistry and mor-

phology of this disease resistance are in active progress. It was found that the presence in the soil of excessive or deficient amounts of different plant food elements does not increase or decrease the severity of rust infection.

Good progress was made in the breeding of cereal crops for winter hardiness, for stiffness of straw and for increased yield of grain of desirable market qualities. Soy beans proved to be a very promising silage crop. An elaborate study of the methods of planting and harvesting corn for silage is in active progress. Sudan grass was found to be a valuable annual forage crop, and the two varieties of sweet clover were found to be useful as forage crops where alfalfa can not be successfully grown. Increased yields of alfalfa as a result of proper inoculation of the soil at seeding time were demonstrated.

The investigations of the cost of producing farm products, which have been in progress for many years, reached a point where it was possible to prepare for publication during the past year, definite conclusions concerning the cost of producing sugar beets, the labor requirements of crop production, the labor requirements for livestock production, and the cost of living on Minnesota farms.

The studies of the process of sorghum-syrup manufacture resulted in the discovery of a method of purification of the juice, whereby a uniformly agreeable color and flavor can be secured in the syrup. This appears to remove the last obstacle to a wide extension of the sorghum-syrup industry in this state.

The investigations of the "strength" of wheat flour have resulted in a much clearer knowledge of the biochemical processes involved in dough- and bread-making and new methods of measuring the bread-making value of flour were perfected and published during the year.

The severe winter of 1915-16 afforded an unusual opportunity for selection of hardy fruit stock and for study of the factors which influence hardiness. Several new strains of hardy fruit are now ready for general distribution.

Several new varieties of vegetables, especially suited to canning or other market requirements, resulted from the breeding and selection work which has been in progress for the past five years.

Studies of coöperation among farmers in Minnesota resulted in the publication of statistics and general information as to the best methods of coöperation in the management of coöperative creameries, co-operative stores, and farmers' elevators. The officers of the Station also contributed materially to the movement for the Federal farm loan law and participated in several studies of rural credit conditions.

Experiments with commercial fertilizers at University Farm, Morris, Crookston, Grand Rapids, and Waseca, including a total of over three hundred tenth-acre plots, in two consecutive years have failed to yield sufficient crop increases to make the treatment profitable. These experiments will be continued and should be extended to include other types of soils than those found on the five experimental farms.

Coöperative experiments to determine the best methods of utilization of the peat lands of the state were started during the year.

Laboratory studies of the organic matter of the soil proved conclusively that the determination of "humus," which has been so extensively used in soil studies, has no significance whatever as an indication of fertility or of the state of decomposition of the organic matter of the soil.

Studies of the physiology of normal hog's blood and of the effect of muscular exercise and environmental conditions upon blood and bodily temperature were completed, thus paving the way for investigations of the effects of disease upon the animal.

The investigations at the Forest Experiment Station, at Cloquet, have resulted in improved methods of lifting, packing, and transplanting which have cut the cost of producing transplanted stock in half, and in definite knowledge concerning the proper kind of stock to use in reseeding in different types of locations. These results will very greatly simplify and reduce the cost of reforestation operations throughout the Northwest.

Service and regulatory work by the Station during the year included the testing of 9,461 samples of seeds for dealers and farmers; the inspection of 117 nurseries and of an enormous number of shipments of foreign stock into the state; 785 stallions were registered and licensed for service in the state; 2,987,785 cc. of hog cholera serum were manufactured and 971,930 cc. distributed during the year.

Needs of the Station.—The most urgent need is for additional research laboratory space for the Divisions of Agricultural Biochemistry, Agronomy and Farm Management, Horticulture, Forestry, and Soils. These Divisions are all occupying cramped quarters and their research work must necessarily be done in laboratories which were equipped for other purposes and which are also used by student classes, which frequently results in the destruction of carefully prepared and expensive research material. A new wood technology laboratory is absolutely necessary if experimental work in wood utilization is to be inaugurated.

Additional men are urgently needed for research work in Animal Pathology, in Agricultural Bacteriology, in Plant Physiology, and in Wood Technology.

The funds available for the maintenance of Experiment Station investigations should be materially increased during the next year, partly by an actual increase in the budget item for this purpose and partly by the caring for elsewhere of certain teaching expenses which have heretofore been erroneously included in this item of the appropriation bill. The necessity for increased maintenance funds arises from the increased cost of scientific supplies, due to the cutting off of duty-free importation from Europe, and to the increased number of research problems which the development of Minnesota's varied agricultural resources is constantly bringing to this Station for solution.

There has been a growing demand, for a number of years past, for a soil survey of this state. The Station has done all that it could, by analyzing samples of as many of the different types of soils which are

found in the state, to supply the desired information; but has never been in possession of adequate data concerning the location and extent of these types, to make it possible to give specific answers to definite local soil problems. The time has now come when work on a definite soil survey of the state should be inaugurated, and a special fund for that purpose should be created.

THE SUBSTATIONS

The experimental work which is being conducted at Morris, Crookston, Grand Rapids, Duluth, and Waseca has now all been organized on the project basis and is regularly reported in the same way as at the Central Station. The Morris, Crookston, Grand Rapids, and Duluth Substations begin with this year the publication of annual reports of their experimental work, for distribution to citizens in the particular portions of the state where the regional problems which are studied at these Substations are found and where their results will be applicable.

The research work at the Forest Experiment Station at Cloquet is developing rapidly. Important results have been obtained and the three-year report of the Station, about to be published, contains many new and interesting facts. The most comprehensive study ever undertaken of the damping-off of seedlings is well under way and a spruce study has been made that will be a long step toward establishing the permanency of the paper industry in Minnesota.

The study of prairie plantations and windbreaks, of the flooded river bottom lands, and of the preservative treatment of fence posts had to be temporarily dropped for lack of funds.

The annual conference between Central Station and Substation men has resulted in much clearer understanding and coördination of the experimental problems and work throughout the state and in the establishment of a very satisfactory basis of coöperation between the several Stations.

THE FRUIT BREEDING STATION AT ZUMBRA

A full report of the work in progress at this important branch of the Experiment Station will be included in the Annual Report of the Experiment Station. The horticulturists of the state have expressed the highest commendation of the work and have given a leading position in fruit lists to several of the fruits that have been developed and tested, especially plums, strawberries, and raspberries. We wish to express our appreciation of the excellent coöperation of the State Horticultural Society in this work. The need of additional land for experimental orchards in connection with this work has been evident for several years and is becoming more urgent. About twenty acres is needed. Additional land is also greatly needed at or near the Central Station at St. Anthony Park for the fruit and vegetable gardening work.

SHORT COURSES

For several years the Department has pursued the policy of making the equipment and instruction of the College of Agriculture available to those who, because of being actively engaged in occupations, are unable to take the full time residence courses. For this purpose "Short Courses" have been conducted at University Farm as follows: Butter makers and Ice-cream makers, five weeks in November and December; Farmers and Home Makers, one week in January; Veterinarians, one week in February; Boys and Girls, one week in April; Traction Engineers, five weeks in May and June; Teachers, six weeks in June and July; Summer Session, College of Agriculture, six weeks in June and July; Rural Life, one week in July. The enrollment in these courses for the year 1915-16 (total, 3,037) is shown in detail elsewhere in this report. To harmonize administration all this work is under a Director of Short Courses.

At the Farmers' and Home-Makers' Short Course a score of state organizations of stock men, crop men, and civic organizations such as farmers' clubs hold their meetings.

Farmers' Short Courses, Boys' and Girls' Short Courses, and Teachers' Summer Courses are conducted at the Northwest School of Agriculture, Crookston, and the West Central School of Agriculture at Morris, and at the latter a Mothers' Short Course is also held.

THE SCHOOL OF AGRICULTURE

The strong bent of the educators of the world toward practical education as a means of social preparedness and the restatement of educational theories in conformity with the new vision of the world's needs, is one of the remarkable phases of modern educational development. "Motivation" may be the term that expresses the new thought for many people, but in the Minnesota School of Agriculture neither the thought nor the practical expression of the thought in courses of study is new, for the practical education given in this School for the past twenty-seven years is the education meeting the approval of the leaders in the educational world.

Through the addition of certain practical courses and the change from the rigid "one-course-for-all" plan to the elective system, the School still further ministers to the direct needs of the boys on the farms of Minnesota. The constantly increasing force and influence of its fourteen thousand attendants and its 2,154 graduates can not but improve rural conditions in this state. This uplifting force can be yet further strengthened by extending the influence of the School to a still larger number of boys and girls on the farms of Minnesota.

There are eight thousand and twenty-four one-room district schools in the state. At least one boy or girl in each school district is failing to get the education adapted to his or her life and environment, because of failure to be informed where the opportunity is presented, for such

education, and the small cost for which it may be obtained. Instead of having only hundreds in our three Schools of Agriculture, there should be as many thousands taking advantage of the opportunities offered. The duty of a State is not ended when it gives opportunity to those who seek for it. In fact it has an even greater duty to take the knowledge of such opportunities to those who would not seek for them. The State could not make better use of its funds than to seek out those who have obtained all the schooling that they can from local sources, and inform them of the courses offered in the Schools of Agriculture. This should be done to the end that the general average of intelligence and vocational preparedness be secured and incidentally as a matter of efficient administration, that the equipment and buildings provided by the State be constantly used to their capacity.

The same schools can well provide as at present a vocational course in agriculture for high-school graduates. The alumni of the School are now so numerous in some counties of the state that they are forming local associations, for the purpose of keeping alive their interest in the work of the school, and for the purpose of doing the definite community service for which they received training at the school.

To be of utmost service to all classes seeking a practical agricultural education, the School should add, for city boys and others who have not had the experience of a life on the farm, a School of Agricultural Practice. Such a school should be on a basis of self-support for the student. It might be so conducted as to be of no expense to the State. Detailed plans for such a school have been submitted, and it is hoped that means may be found for carrying them into execution.

The School of Agriculture has a distinct sphere, that of preparing farmers for their life work. It has done this work successfully for more than a quarter of a century. It is hoped that no false ideals may be urged to change this distinct service, but rather that it may receive the attention, and the encouragement which its most necessary service warrants and deserves.

Investigation discovered a large demand for work in Farm Motors. A special course was introduced during the second term of 1915-16 which proved very popular, and additional work along this line has now been provided for the regular three-year course. The courses for both boys and girls have been changed to allow a considerable amount of elective work. The required work has been so arranged as to permit high school graduates to complete the course in two years and graduates of a high school agricultural course, to complete the course in one additional year. This work is, as heretofore, strictly non-collegiate.

NORTHWEST SCHOOL AND STATION, CROOKSTON

Changes in Faculty.—There have been very few changes in the School faculty and Station corps during the past two years. The work has been divided more definitely, permitting the hiring of instructors who have specialized in their various lines, resulting in better teaching, and in raising the standard of the School.

New courses.—The three-years' course for boys is continued practically unchanged, with the exception of dividing it into elective and required units. This plan is an improvement over the former rigid course. The three-years' course for girls was discontinued, and in its place, two courses were organized. One is of two years of six months each, and is highly vocational. The other is a four-years' course of nine months each, in which Home Economics subjects are given special emphasis, but in which there is a larger amount of so-called academic subjects, culminating in a teachers' training course during the fourth year.

Practice work in Agriculture.—The summer practicum work required of the boys attending the Northwest School has been successfully conducted since it was begun in 1911. While it is not possible for each of the students to carry on a definite project, about eighty per cent of them do so. In the home supervision of this work, the members of the School faculty get into touch with the home conditions of the students, and also with the agricultural conditions in the communities from which our students come. A closer relationship is established which is of value to the farmers and School alike. Additional emphasis has been placed upon actual farm practice work done at the School during the regular school year, especially in stock feeding, horticultural and poultry work.

Teachers' Training Course.—This is in its fourth year, and is slowly making a distinct place for itself in Minnesota. The plan of organization, the ungraded elementary school used in conducting this course, the correlation between pedagogical work and both home economics and agriculture, and the distinctly professional attitude of the students in this department make it an educational experiment that is worthy of more attention and support. The summer courses for teachers have been well attended.

Junior Short Course.—The Junior Short Course is awakening greater interest each year, as is shown by the enrollment. It is expected that a much larger number will attend next March.

Farmers' Week.—Farmers' Week held in connection with the Farm Crops Association continues to engage the attention of large numbers annually. While it is impossible to hold these meetings at the school on account of lack of transportation facilities and rooms, the close relationship existing between the Farm Crops Association and the School makes the present arrangement entirely satisfactory. The Superintendent of the School is the General Chairman of the Farmers' Week, and arranges the entire program. During this week the various organizations for the promotion of agriculture in northwestern Minnesota hold their meetings at Crookston. Through a chain of Farmers' Clubs and local associations

throughout northwestern Minnesota, the ideas brought out at this meeting are spread to every corner of the district.

Interest in the School by citizens and organizations.—The past year has been the most fruitful in the manifestations of interest in the work of the School and Station since its organization. A meeting was held at Crookston in September at which plans were formulated to provide a loan fund for needy students of the school. Through action of the Board of Regents, the Gilfillan Trust Fund was made available to the students of this School. In case this proves insufficient, a large number of citizens have expressed themselves in favor of providing a Northwest School Loan Fund. A fund of more than one thousand dollars has already been promised, altho no direct canvass has yet been begun.

Of even greater importance was the action taken to provide a number of scholarships for the students of the Northwest School. At this writing fifteen scholarships, of $125 each, have been provided. They will be awarded for special proficiency in the various lines of school work and as awards for special success in Boys' and Girls' Club Contests in the various counties in this section of the state.

Station work.—The Station work embraces the most important problems confronting the farmers of the Red River Valley. Our first five-year report will be ready early this fall. It will show a considerable amount of definite data already secured and progress on a number of projects that are under way.

Drainage.—Through the establishment of County Ditch No. 99, the east portion of the station lands will be sufficiently drained, and provision will have been made to take care of overflow water from lands adjoining the station on the east. Additional tile drainage has been installed during the present year.

Coöperative work.—The School and Station is already closely identified with various organizations through which much is being done in various fields. The Station poultryman is president of the Northern Minnesota Poultry Association, and does considerable field work in connection therewith. The horticulturist and agronomist are connected with the Red River Valley Horticultural and Pure Seed Associations, and are conducting coöperative trials in these fields. The agricultural instructors in high schools, the Red River Valley Livestock Breeders' and Dairymen's Association, and the Development Associations are all closely allied with our work here, and the finest kind of coöperation is manifest on all sides. Through the County Superintendents and the teachers' training department, the rural schools are being helped. Farmers' Clubs call constantly, and increasingly for services that help build up this part of the state.

The field work taken up by Mr. Enerson this summer is proving to be very acceptable to the farmers. It will require all of his time to follow up this work, especially as the demand for farm account books is so great. The coöperative seed work is another feature of extension work that is in great demand. We should greatly extend our field services to the people. There are no county agents in this part of the state, which

renders it more imperative still that these closer relationships should be increasingly fostered.

School and Station fields and grounds.—The Station and School grounds are gradually coming into shape so that from now on we may reasonably expect to use less money and labor upon improvement work.

The prevalence of the sow thistle in the northern part of the Red River Valley, and the rapid southern progress of this weed require drastic means to check it, and to eradicate it from within the infested areas. A representative gathering of farmers, business men, and legislators of this section of the state held at the school on October 9 went on record with but one dissenting vote, in favor of the enactment of the Canadian Weed Control Law, providing for the appointment by the State Commissioners, of weed inspectors. In addition, they urged an active educational campaign. This means field work with individual farmers, which would open in April, and continue to October. The weed is rapidly spreading, and will continue to do so until proper legislation is enacted, and adequate educational efforts are put forth. Inasmuch as it is a Red River Valley problem at this time, it is our duty to attack it and to strengthen greatly extension work with farmers along these lines.

Transportation problem.—The lack of transportation facilities for any considerable body of students at this institution constitutes a vexed problem. It is hoped that a flag station will be established at the School spur track but that will not solve it. We have a school bus capable of carrying fifteen at a time. When we use our heavy farm horses, we can transport fifty or sixty at one time. If the School is to attain its fullest development and to utilize the investment here it will be necessary to provide more satisfactory means of transportation.

Dining Hall and Serving Building.—The need of a new dining hall and remodeling the first floor of Stephens Hall, now used as a temporary dining hall, was fully presented two years ago. An adequate building of fire proof construction, including quarters for help, and remodeling Stephens Hall will cost $100,000.

Engineering Building addition.—Increased space in the Owen Building which contains only one room for engineering work is needed. This building also contains the dairy manufacturing and stock judging rooms, as well as the carpentry and blacksmithing shops. The best plan would be to convert the Owen Building eventually into an engineering building and to secure a separate building for livestock and dairying classes. If this is decided on, plans can be made now to increase the space in Owen Building to care for present needs. Future needs can then be met by construction of a separate livestock building.

Waterworks connection.—Approximately $5,500 were used in providing water connection to the School. An item of $6,000 was appropriated for this work by the last Legislature, but through error that item did not appear on the engrossed bill. A special request to reimburse the University Reserve Fund should be included in the budget for the coming biennium.

Drainage ditch.—The Board of County Commissioners ordered the establishment of County Ditch No. 99 which drains the eastern portion of Section 19, where the Northwest Experiment Station is located, and takes care of overflow water that formerly flooded our fields. An appropriation of $1,050 will be necessary to pay this assessment.

In order to increase the efficiency of the School, the Owen Building should be remodeled into an adequate Farm Engineering Building. This would remove from that building, the rooms used at the present time for dairying, stock judging, and other classes. A new Livestock Building would then be necessary. This should be located south of Senior Hall, and should contain offices, class rooms, stock judging pavilion, and other necessary space to care adequately for the livestock section here.

WEST CENTRAL SCHOOL OF AGRICULTURE, MORRIS

The year closed August 1, 1916, was one of the best in the history of the institution. The student body is becoming more able to carry real technical work because of their better preparation. A class of twenty-five was graduated from the winter course. Two boys returned for fourth-year work, one of whom was practically fitted for college entrance in connection with other work that he had previously had. The other came back for special training in Dairying in order to take charge of his father's herd and farm. The Farmers' Short Course, regularly held the third week in February, was well attended and enthusiastically received by the men present. Work was given in Dairy Husbandry, Beef Raising, Farm Management, and Automobile Construction. The Junior Short Course, held the last week in March, was also successful in every way. In connection with the regular school work, a Band and Orchestra were developed with excellent credit to the institution.

The most urgent needs for the coming biennium include the following: reorganization of the work so that the short-term faculty members may be employed upon a nine or twelve months' basis; a completion of the reorganization of the course of study; the organization of a nine-months' course for girls and others who can spend a longer time at the institution, especially in connection with a Normal Department for rural school teachers; adequate provision for gymnasium work; provision for laboratory work in a greenhouse during the winter months. Provision for slaughtering animals in connection with the class instruction in this subject.

REGISTRATION OF STUDENTS

Attendance.—The following table shows a comparison of the attendance in the Department of Agriculture during the years 1915-16 and 1914-15. That for previous years is to be found in earlier reports:

TABLE I—ATTENDANCE 1915-16 AND 1914-15 DEPARTMENT OF AGRICULTURE

	1915-16	1914-15
COLLEGIATE COURSES:		
Graduate students majoring in Agriculture:		
Men	34	33
Women	1	7
Total	35	40
Agricultural Courses:		
Senior Class	64	46
Junior Class	86	60
Sophomore Class	104	105
Freshman Class	114*	138
Unclassed	10	11
Total	377	360
Forestry Course:		
Senior Class	10	8
Junior Class	5	7
Sophomore Class	10	4
Freshman Class	16	22
Unclassed	2	0
Total	43	41
Home Economics Course:		
Senior Class	50	42
Junior Class	72	50
Sophomore Class	82	69
Freshman Class	90	89
Unclassed	17	23
Total	311	273
Summer Session:		
Men	87	56
Women	52	33
	139	89
Duplicates registered		
Men	32	26
Women	10	6
Net Total	97	57

* It is interesting to note that one woman matriculated in the agricultural course with the intention of specializing in Horticulture.

Total, Collegiate Courses		
Men	475	431
Women	354	300
Total	829	731

CENTRAL SCHOOL OF AGRICULTURE:

	1915-16	1914-15
Senior Class		
Men	99	102
Women	62	65
Total	161	167
Junior Class		
Men	165	191
Women	67	87
Total	232	278
Freshman Class		
Men	293	284
Women	73	109
Total	366	393
Unclassed, including graduates registered for advanced work		
Men	3	20
Women	0	17
Total	3	37
Normal Course	19	...
Total, School of Agriculture		
Men	560	598
Women	221	277
Total	781	875

SHORT COURSES:

	1915-16	1914-15
Dairy School		
Butter and Cheese Makers	82	100*
Advanced Creamery	12	
Ice Cream Makers	25	39
Duplicates	23	25
Net Total	96	114
Farmers' Week		
Men	969	540
Women	282	87
Total	1251	627
Junior Short Course		
Boys	344	279
Girls	145	124
Total	489	403

Traction Engineering	23	20
Teachers' Training School		
Men	124	89
Women	990	941
Total	1114	1030
Rural Life Conference		
Men	34	...
Women	4	...
Total	38	...
Graduate Veterinarians	26	...
Total of Short Courses		
Men	1616	1041
Women	1421	1153
Total	3037	2194
Total at University Farm		
Men	2685	2216
Women	1998	1738
Duplicates		
Men	31	2
Women	1	0
Net Total	4651	3952

NORTHWEST SCHOOL OF AGRICULTURE:	1915-16	1914-15
School Course		
Men	157	124
Women	50	55
Total	207	179
Farmers' Short Course		
Men	477	1412
Women	25	406
Total	502	1818
Junior Short Course		
Boys	49	24
Girls	31	22
Total	80	46
Teachers' Training School		
Men	14	5
Women	207	140
Total	221	145
Total, Northwest School of Agriculture		
Men	697	1565
Women	313	623
Total	1010	2188

WEST CENTRAL SCHOOL OF AGRICULTURE:

	1915-16	1914-15
School Course		
Men	70	76
Women	45	57
Total	115	133
Teachers' Training School		
Men	9	9
Women	159	155
Total	168	164
Junior Short Course		
Boys	36	...
Girls	8	...
Total	44	...
Mothers' Week	6	...
Total, West Central School of Agriculture		
Men	187	85
Women	219	212
Total	406	297
Total in the Department of Agriculture		
Men	3538	3864
Women	2528	2573
Total	6066	6437

COLLEGE OF AGRICULTURE AND FORESTRY

Courses of study.—During the past year comparatively few important changes in the courses of study have been made. The following outline shows analyses of the curricula as they have been adopted for the coming year in comparison with those for 1915-16. The analyses are made on a percentage basis to permit of a comparison independent of the number of credit hours required for the degree. They serve to show the relationship between the various lines of specialization as well as the specific changes in subject matter. The analyses are on the basis of the work offered by the several divisions and departments without a grouping of courses of allied divisions. This serves to show what each division is offering in required work in the various curricula, but should be considered in connection with the fact that the electives offered may materially affect the proportion of work from any of the divisions in any of the lines of specialization, with the exception of those showing practically no elective work.

Particular attention is called to the following details:

1. College of Agriculture
   a. The Agricultural Courses
      (1) There is a decrease in the required work in Agricultural Engineering due to a reduction of the work previously given as "Agricultural Physics" and "Farm Structures" (6 credits to a single three credit hour course).

(2) The decrease in the required work in Economics is due to the condensation of the work previously given in Elements of Economics and Agricultural Economics to a special three credit hour course in the Principles of Economics for Agricultural Students.

(3) Political Science, 1, American Government has been introduced as a required course in all lines of specialization.

(4) The required work in Veterinary Science in the Dairy and Animal Husbandry Courses has been materially increased.

(5) Bacteriology has been introduced in all lines of specialization.

b. The Home Economics Courses

(1) The number of credit hours required for graduation has been reduced to 132. This decrease is wholly in the freshman year where the required amount of work has been reduced from 17 to 15 credit hours each semester. The large number of small percentage increases is due to this decrease in total number of credit hours.

(2) The decrease in Bacteriology is apparent rather than real as the course in the 1915-16 bulletin carried excessive credit.

(3) The figures for the Home Economics work fail to show the actual differences between the three lines of specialization, as they differ principally in the subject matter of the required work in the Home Economics division.

2. College of Forestry

(1) Introduction of new curricula in *Commercial Lumbering* and *Wood Pulp* and *Distillation Products*. This work was previously arranged in individual cases with the consent of the Director of the College of Forestry.

(2) The elective work has been increased. The course has been entirely prescribed up to the present time, altho liberal substitutions for required work have been allowed.

(3) Elimination of foreign language as a part of the required work.

(4) Introduction of a large amount of Economics in the Commercial Lumbering course.

(5) Introduction of a large amount of Chemistry in the Course in Wood Pulp and Distillation Products.

3. All Collegiate Courses

(1) The addition of Public Health Lectures for all seniors in uniformity with other Colleges of the University.

(2) The introduction of a course of lectures for all freshmen and new students intended to acquaint them with the College, College regulations, customs, and traditions. These include talks on the honor system, Faculty regulations, use of Library, extra-curricula, student activities, and other topics of value to students entering the College for the first time.

(3) The College is now recognizing work done in secondary schools in Botany, Chemistry, Mathematics, Physics, Mechanical Drawing, Agriculture, and Home Economics in allowing substitution of elective work for some of the required elementary courses in these subjects.

Distribution of students in the courses of study.—Under the regulations of the College, students are required to select some line of specialization before May 1 of the sophomore year. The selection must be approved by the head of the division offering the special course.

The work of the sophomore year differs to some extent with the line of specialization, one half the required work being the same for all students. As a result the choice of a major is usually made at the beginning of the sophomore year. The electives in the junior and senior years, however, enable a student to change his line of specialization at the beginning of his junior year without loss of credit toward graduation. After registering for a special course, a change in the major is made only on approval of the Students' Work Committee. This check serves to prevent shifting from one course to another simply for the purpose of evading individual subjects. Substitutions for required work in the special lines are freely allowed by the committee on recommendation of the division in which the student is specializing. Practically no substitutions are allowed for the fundamental subjects common to all courses in the first two years.

Respectfully submitted,

A. F. Woods, *Dean and Director*

THE LAW SCHOOL

To the President of the University:

SIR: I hereby submit the following report of the work of the Law School of the University during the session 1915-16.

Attendance.—The subjoined statistics of registration, marked table I, show the registration during this session as compared with that of the preceding session. It will be observed that while the first-year class shows the increase expected, the total registration shows a decrease of six. This decrease is due to the unexpectedly small registration in the third-year class, that class being smaller by nineteen than the corresponding class of the preceding session. The most striking fact, it will be observed, in our registration statistics, is the very large loss sustained in each session's first-year class. During the three sessions, 1912 to 1915, only about sixty per cent, on the average, of the first-year class are found registered in the second-year class of the succeeding session. The forty per cent loss is made up roughly as follows: dropped for poor scholarship, 20 per cent; unable to return for financial reasons, 10 per cent; unknown causes, 10 per cent. Each first-year class also contains a few academic seniors who take their first year of law in order to qualify for the academic degree, without any intention of completing the course. The larger portion of the total loss of each session's first-year class is made up of the special students who find it difficult to do the quantity and quality of work demanded.

TABLE I. REGISTRATION

	Regular		Special		Total	
	1914-15	1915-16	1914-15	1915-16	1914-15	1915-16
First year	51	61	29	31	80	92
Second year	32	38	12	7	44	45
Third year	49	29	4	5	53	34
					177	171

Faculty.—No change has taken place in the faculty excepting the appointment of Mr. Z. L. Begin to take the place of Mr. H. K. Elder, resigned, as Instructor in Practice in charge of the Legal Aid Bureau. On account of the inadequate salary that is paid to the attorney in charge of the Legal Aid Bureau, who acts as Instructor in Practice, as well as the opportunity afforded to him to enter into private practice under favorable conditions, it will probably be impossible to avoid making a change each session in this position. The work of the Legal Aid Bureau is developing rapidly and its value as a laboratory for the students of the Law School becoming more and more manifest. It may well be that we

may in the near future be justified in increasing the salary paid by the University to the instructor acting as head of the Bureau in order to keep an able and efficient man in the position.

The large registration in the first-year class, ninety-two, necessitated the division of this class into two sections. As a consequence it was necessary to increase unduly the amount of classroom work required of each member of the faculty.

Lecturers.—During the session, special lecture courses were given as follows:

Jurisdiction of and Procedure in the Federal Courts, by Chas. W. Bunn

The Commerce Clause of the Federal Constitution, by Frank B. Kellogg

Practice in the Supreme Court, by Chief Justice Calvin L. Brown

The Practice of Criminal Law, by C. D. O'Brien

The Police Power, by Thomas D. O'Brien

Legal Ethics and the Practice of Law, by Judge Chas. S. Jelley

Real Estate Titles and Abstracts, by A. L. Helliwell.

It is hoped that the course of lectures by Chief Justice Brown of the Supreme Court of the State, given for the first time during this session, will be continued in future sessions.

Instruction in Practice.—The difficult undertaking of developing an effective course of instruction in Practice is progressing with gratifying success. Professor Morgan's efforts to train students so that they can conduct actual proceedings in court with credit to themselves and safety to their clients have been zealous and unceasing. The Legal Aid Bureau is being used with increased success in providing for the students opportunity of actual contact with real clients. The cases passing through the office during the session amounted, during the year, to about three thousand. These cases, while involving small amounts and usually unimportant matters, nevertheless present nice and interesting questions of law and afford to the students in the office a range of practical experience far wider than would be enjoyed by them in an ordinary law office. The development of this laboratory phase of legal education in this Law School is being watched with great interest not only by the faculty in this Law School but by those in charge of other law schools as well.

The Library.—The steady progress of the library is shown by the figures given immediately below:

Volumes in Library September 1, 1912	17,000
Volumes added during 1912-13	1,540
Volumes added during 1913-14	1,760
Volumes added during 1914-15	2,702
Volumes added during 1915-16	1,639
Total	24,641

From this statement it appears that during the past four years there have been added to the library 7,641 volumes, or nearly one third of the

total number now in the library. The total number of accessions to the library during the session 1915-16, viz. 1,639, is seen to be considerably smaller than the number of accessions during the preceding session. This is due partly to the fact that the number of books secured by gift or exchange, 526, is smaller because of the exhaustion of our exchange material, and partly because many of the books purchased were expensive volumes on foreign law and rare reports needed to fill in existing sets.

During the last winter the library suffered a disaster from the breaking of a sprinkler pipe in the attic over the reading room, causing a flood of water to descend into the reading room where about seven hundred volumes were more or less seriously damaged by water. The sum of $562 was received from the insurance company in settlement of the consequent loss. Partly on account of the damage done by this flood, the amount expended for binding and repairing amounted to the large sum of $726.25. Continuations of regular series of reports and periodicals cost $1,113.03, while the cost of casebooks purchased for the use of students during the year was $508.26.

Needs of the Library.—It is very clear that, with the constantly increasing expense of carrying continuations, the steadily mounting cost of rebinding, and the need for more library service, we shall soon reach the point where the substantial growth of the Law Library will be impossible without a larger appropriation than is now provided.

The needs of our students require that the library shall be kept open seventy-eight hours a week, which is more than in most law libraries. The three student assistants now provided take care of only sixty hours, thus making it necessary for the Librarian and the Cataloger to make up the other eighteen hours of supervision of the reading room. This interferes with the cataloging, which has fallen behind, and with other duties of the Librarian. A fourth student assistant should be provided.

Attention must again be called to the necessity for making an early provision for the more adequate housing of the Law Library. The shelves in the reading room and in the one small stack room are already filled and temporary arrangements for accommodating accessions will have to be made. Moreover the present building is not fireproof so that our very valuable collection of books is constantly exposed to the danger of fire and water.

A new Law Building.—The pressing need of providing adequate fireproof housing for the law library emphasizes the need of considering plans to provide better suited quarters for the conduct of the work of the Law School. The present building, never well suited to the uses of the Law School, is now becoming much crowded, not only in its library, but in its office rooms and classrooms.

Casebooks.—We are endeavoring to abandon gradually the long-continued custom of providing casebooks for the use of students in the classroom. This practice seems to obtain in no other law school in the country. It is undesirable in that it entails a heavy expense upon the library and prevents the students from purchasing their own books, which might

be annotated and thus rendered valuable in later professional life. It is also found impossible to prevent students from abusing books for which they feel little responsibility, the result being that casebooks supplied by the library very soon fall into disrepair.

New prizes established.—I am glad to be able to report that Mrs. Edwin Ames Jaggard, widow of Judge Edwin Ames Jaggard, a former professor in this Law School, has offered a prize of fifty dollars to be awarded annually to the writer of the best essay on some topic in legal history to be assigned by the faculty. The American Law Book Company has offered a set of the Cyclopedia of Law and Procedure, forty-two volumes, to be awarded annually as a prize to that member of the third-year class who has maintained the highest standard throughout his course in the Law School.

Statistics of scholarship.—There are given below certain tables of statistics of scholarship showing, in summary form, the work done by the students in the Law School during the session. Table II shows the scholarship of all classes.

TABLE II. SCHOLARSHIP STATISTICS

	First Year		Second Year		Third Year	
	1st sem.	2nd sem.	1st sem.	2nd sem.	1st sem.	2nd sem.
1. Total enrollment	89	78	45	45	32	33
2. Number taking examinations	81	75	44	43	32	32
3. Number passing all examinations	36	31	25	18	22	29
4. Number delinquent in one subject only	17	16	7	12	6	3
5. Number delinquent in three or more subjects	16	17	8	9	3	0
6. Percentage of conditions and failures to total examinations	23	28	18	21	10	1
7. Percentage of successful students to total enrollment	40	39	55	40	68	93

Item 5 in the tabulation given above indicates roughly the number of students who were dropped for poor scholarship. Item 3 shows the number of students regarded as satisfactory and successful, while item 7 shows the percentage of successful students to the total enrollment. It will be observed that the percentage of successful students is still distressingly low, altho tending to increase with the improvement in the quality of work done by the students. Our students are still disposed to regard the study of law as an undertaking requiring only a part of their time and energy.

Table III concerns only the first-year class. It is intended to show the relation between preliminary training and the success of the student in the Law School. The figures given show very clearly the greater efficiency of those students who have had a more adequate preliminary training.

TABLE III. PRELIMINARY TRAINING AND SCHOLARSHIP
(FIRST YEAR CLASS)

	REGULAR				SPECIAL	
	Academic seniors and graduates		Having two years of college		Less than two years of college	
	1st sem.	2nd sem.	1st sem.	2nd sem.	1st sem.	2nd sem.
1. Total enrollment	19	20	39	38	31	20
2. Number taking examinations	19	18	38	37	24	20
3. Number passing all examinations	12	12	19	17	5	2
4. Number delinquent in three or more subjects	2	2	4	5	10	10
5. Percentage of failures and conditions to examinations taken	13	16	13	20	29	50
6. Percentage of successful students to total enrollment	63	60	48	44	16	10

Table IV shows the number of conditions, failures, and incompletes given to all the classes during both semesters of the session.

TABLE IV. CONDITIONS, FAILURES, AND INCOMPLETES

	REGULAR STUDENTS	SPECIAL STUDENTS	TOTAL
First semester			159
Incompletes	0	1	1
Conditions	91	49	140
Failures	9	9	18
Second semester			194
Incompletes	14	14	28
Conditions	90	43	133
Failures	13	20	33

Respectfully submitted,
WILLIAM R. VANCE, *Dean*

THE MEDICAL SCHOOL

To the President of the University:

SIR: I beg to report upon conditions in the Medical School for the year 1915-16 as follows, including the interests especially entrusted to it. the University Hospitals, the School for Nurses, and the School of Embalming.

THE MEDICAL SCHOOL (PROPER)

Deaths.—The School has recorded, with great regret, the death of Dr. Charles A. Wheaton, Emeritus Professor of Surgery, who for many years gave himself devotedly to pioneer work in medical education in the state of Minnesota and who was one of the men who helped to create the Medical School. The state should find a way to recognize and record its appreciation of the service of such men.

Resignations.—Dr. Robert H. Mullin, Associate Professor of Public Health, Dr. Walter E. Camp, and Dr. William F. Allen, Instructors in Anatomy, and Dr. C. A. Scherer, Instructor in Pediatrics, have resigned.

New appointments.—The following have been added to the teaching staff: Leonard G. Rowntree, Professor of Medicine and Chief of the Department; J. S. Gilfillan, Associate Professor of Medicine; Henry M. Bracken, Professorial Lecturer in Hygiene; Marion A. Tebbets, Director of the Social Service Department and Instructor in the Faculty; John M. Armstrong, Clifton A. Boreen, Paul B. Cook, and G. M. Olson, Instructors in Dermatology and Syphilis; J. F. Avery, A. R. Hall, J. R. Turner, F. W. Wittich, and C. B. Wright, Instructors in Medicine; Anne G. Benton and W. Ray Shannon, Instructors in Pathology and Bacteriology; Rae T. LaVake, Instructor in Obstetrics and Gynecology; Andrew T. Rasmussen, Instructor in Neurology.

Promotions.—The following promotions were recommended by the Administrative Board and approved by the Board of Regents: A. S. Hamilton, from Associate Professor to Professor of Nervous and Mental Diseases; J. P. Sedgwick, from Associate Professor to Professor of Pediatrics; S. Marx White, from Associate Professor to Professor of Medicine; F. L. Adair, from Assistant Professor, and J. L. Rothrock, from Assistant Professor, to Associate Professor of Obstetrics and Gynecology; Arthur T. Mann, from Assistant Professor, and John T. Rogers, from Assistant Professor, to Associate Professor of Surgery; Walter R. Ramsey, from Assistant Professor, to Associate Professor of Pediatrics; Moses Barron, from Instructor to Assistant Professor of Pathology; E. M. Hammes, from Instructor, and Angus W. Morrison, from Instructor, to Assistant Professor of Nervous and Mental Diseases; Horace Newhart, from Instructor, to Assistant Professor of Oto-Laryngology; Oscar Owre, from Instructor, to Assistant Professor of Genito-Urinary Diseases; Arthur C. Strachauer, from Instructor, to Assistant Professor

of Surgery; H. L. Ulrich, from Instructor, to Assistant Professor of Medicine; Chester A. Stewart, to be Instructor in Anatomy.

New departments.—Two divisions of clinical teaching have been organized as new departments of instruction—the Department of Pediatrics and the Department of Ophthalmology and Oto-Laryngology.

Administrative Board.—The Chiefs of these Departments, Dr. J. P. Sedgwick and Dr. Frank C. Todd, have therefore become members of the Administrative Board. An additional faculty representative upon the Board has been provided, to which position Dr. Emil S. Geist has been chosen for a two-year term.

Full-time teachers.—The School congratulates itself upon the further development of a system of full-time clinical teaching, by the appointment of Dr. Leonard C. Rowntree, formerly of Johns Hopkins University, as Chief of the Department of Medicine.

Graduate work.—The Teaching Fellowships, which represent an important feature of the graduate work being done in the Medical School, have been increased in number from ten to twelve. They are proving their great value as a means of encouraging the adequate training of specialists and as a means of providing competent full-time assistants in the clinics.

The Shevlin Fellowship in Medicine has been held by Charles A. Magoon, working chiefly in Bacteriology.

Limited registration.—A limit of eighty, put upon entrants to the Medical School by action of the Board of Regents, has been dictated by the inadequacy, in particular, of the hospital facilities of the School. Applications to the number of 115 were received. The comparative merit of applicants has been determined by records of scholarship, by references as to character and fitness, by physical examination, and by general information and psychologic tests. There was a total registration in the regular session of the Medical School of 258.

The Summer Session of the Medical School was open, in the past year, only to undergraduates. Clinical courses for practitioners were abandoned as there seemed little demand for such courses here, and they are moreover an undesirable form of graduate work. The attendance in the Summer Session was large, 153 students being registered for work in the Medical School, distributed as follows: Medical, 91; Academic, 5; Home Economics, 25; Graduates, 2; Dental, 29; Nurses, 1. Eleven students were from other universities.

The Social Service Department has been enlarged by one additional worker. It has not only justified its creation in the service it has already rendered alike to clinicians and patients, but it has opened up possibilities of service which invite better coöperation and larger support.

Clinical development.—The addition of a roof-house to the Service Building of the University Hospitals, provided from the reserve fund of the Medical School, has furnished quarters for the intern staff, whose former suite of rooms has been converted into a chemical laboratory, equipped, in the main, by contributions of apparatus and material from

other laboratories of the School. This will render possible the systematic investigation of available clinical material.

The Out-Patient Department, removed last year to Millard Hall, suffered some loss in numbers of patients as a result of its change of location. From this loss it has fully recovered and again approaches the maximal limit of its capacity.

The Committee on Hospital and Clinical Development has under consideration a plan for the extension of the University Hospital system upon a partially self-supporting basis. Of the need of such extension there is no room for adverse argument. It is the one urgent problem upon the solution of which the continued development of the School depends.

A Clinical and Pathological Conference serves as a seminar in which comparative studies upon patients under treatment or coming to autopsy are reviewed.

Microscopes.—With the approval of the Board of Regents, a rule requiring each student of medicine to provide himself with an approved microscope has been put in force and with the promise of good results in the students' work.

The School of Embalming conducted an eight-weeks session, beginning January 4, and had a registration of fifty-five students, who showed a higher average of attainments and scholarship than in preceding years.

The reports of the University Hospital and of the School for Nurses are appended and made a part of this report.

Respectfully submitted,

E. P. LYON, *Dean*

UNIVERSITY HOSPITALS

The report of the Superintendent is submitted as follows:

SUMMARY FOR YEAR ENDING JULY 31, 1916

Hospital

Patients in Hospital August 1, 1915	138	
Patients admitted during the year	2,216	
Patients treated during the year	2,354	
Average days per patient	25	
Highest daily census	181	
Daily average number of patients	151	
Daily average cost per patient		$1.439
Daily cost per capita for provisions for all persons supported		0.239

Out-Patient Department

New patients treated	12,325	
Total patients visits made	41,251	
Average visits per day (new patients)	41.22	

Average visits per day (total)	151.37	
Daily average cost per patient		$0.259
Total prescriptions issued		
Drug	18,324	
Optical	893	
	19,217	

The alterations essential to the use of the first floor of the Elliot Memorial Building for the care of patients were completed in late November, 1915, and the floor was opened for the reception of male surgical cases on December 3, 1915.

A larger **morgue** was provided by the utilization of space on the first floor of the service building and sufficient equipment secured to make it possible for autopsies to be done at the hospital instead of at the Pathology Building.

New quarters for interns were provided by the construction of a frame structure, consisting of twelve rooms with halls and toilet, on the roof of the service building. This was occupied in July, 1916, and the old intern suite in the Elliot Building is now undergoing alterations for use as a laboratory for the Department of Medicine. Equipment for this laboratory will come largely from the laboratories in Millard Hall and the Anatomy Building.

A small room on the third floor is now being equipped as a laboratory for routine blood examinations and urinalyses. This affords a place for the clinical clerks to do their laboratory work.

SOCIAL SERVICE DEPARTMENT

Organization.—This department opened November 1, 1915, with the appointment of a director. A two months' study of the field preceded actual medical-social work, which has only been in effect therefore seven months, and is necessarily still in a period of organization. A stenographer and another worker have been added to the department staff during the period. The worker in question was, however, given leave of absence for six weeks for special work in Chicago, leaving her in service here only four and a half months. Some student assistance was secured through coöperation with the Sociology Department.

It is obvious that the field of work is too large for the present number of workers. We can meet the needs of only a small part of the Out-Patient Department and at no time have been able to take cases from the Hospital proper.

Aim.—The aim of the department has been to make the treatment of out-patients more effective. The social worker is trained "to think of a human being as a whole just as naturally as the physician concentrates upon a part." She, then, contributes to the physician the facts which he has not, so that he may use them in his treatment; she sees that the prescribed treatment is made effective.

This may occasionally involve only a confidential relationship established in the clinic. It much more frequently means following the patient into his home or into his place of work—looking for causes, making readjustments in environment, or patiently struggling with ignorance, poverty, or vice.

The social worker's aim, like the physician's, is to get behind the symptoms and back to the cause. As medical diagnosis has become more and more searching, it is now turning to the social as well as the physical body, and the medical-social worker becomes regarded not as a fad or an experiment, but a reliable part of the medical program—a serviceable right hand.

Summary of work with patients.—Figures showing the extent of the work done by the Department follow:

Total number of families assisted	490
Total number visits made to or in behalf of patients	521
Number of different agencies coöperated with	45
Number of clinics referring cases	11
In addition to this group special studies were made as follows:	
Dermatology (luetic cases)	3 months
Nervous and Mental	1 month
Tuberculosis	1 month

The future.—As a part of an educational institution, we realize our responsibility to the students and plans are made to offer an elective in Medical-Social Problems to junior and senior medical students. This not only will meet the larger educational responsibility which we have, but will at the same time give the department much needed field workers. These can not be utilized profitably to themselves or the department, however, without a sufficient number of paid workers to supervise their efforts.

Your attention is called to the attached report of the Superintendent of the School for Nurses.

I again earnestly recommend that suitable housing facilities for the School for Nurses be provided.

I also recommend that porches be built between the Elliot Memorial and the service building, facing south on each of three floors. These porches are necessary for the purpose of getting certain types of cases out in the open air.

Respectfully submitted,

L. B. BALDWIN, *Superintendent*

THE SCHOOL FOR NURSES

The report of the Superintendent for the year ending July 31, 1916, is submitted as follows:

Applications received	41
Student nurses matriculated	21
Student nurses withdrawn or dropped, preliminary	5

Student nurses withdrawn, undergraduates	3
Students graduated	12
Accredited nurses accepted	12
Accredited nurses dropped	1
Certificates to accredited nurses	6

Nursing Staff in Hospital and Out-Patient Department

Registered nurses	
Superintendent, School for Nurses	1
Assistant superintendent	1
Operating department	1
Obstetrics department	1
Night supervisor	1
Pediatrics	1
Surgical floors	2
Medical floors	2
Out-Patient Department	2
Student nurses	
Seniors	9
Intermediates	18
Juniors	11
Probationers	6
Accredited	11

The general health of the nurses has been good. The total number of days of illness among all nurses, graduates and students, has been 293 during the year, an average of 4.73 days per nurse.

The number of applicants for entrance is steadily increasing. Of the sixteen students entering the School during the year, seven have had more than high school work, varying from one to four years of college or normal school work.

We now have four of our own graduates as members of the staff, which is a decided advantage to the School.

During the second semester an elementary course in Sociology was given for the seniors by Dr. A. C. Todd of the Department of Sociology. These lectures were attended by students from several other training schools, as well as by some of the Public Health nurses.

Our need for a nurses' home is each year growing more insistent, and with the growth of the School our teaching facilities are becoming more and more inadequate.

A small classroom in which to teach the practical nursing technique was given us during the year. This room is so small that only six to eight nurses can be accommodated at a time for demonstrations. This makes it necessary to divide a class into sections, which is a waste of the instructor's time. For practice the room is impossible. The classes in Invalid Cookery must also be taught in sections because of the lack of room.

It is impossible for us to provide any social home life for our group, because there is no place large enough to accommodate even one class.

The School for Nurses has grown to a point where it is furnishing a nursing service, which is indispensable, for your teaching hospital. At the end of six years our housing is still as unsanitary, uncomfortable, and inadequate, our teaching equipment as meager as it was six years ago.

I feel that this condition is an injustice to the students of this department of the University.

Respectfully submitted,

LOUISE M. POWELL, *Superintendent*

THE COLLEGE OF DENTISTRY

To the President of the University:

SIR: I herewith submit my report as Dean for the year 1915-16.

Four-year course begun.—The first successful inauguration of a four-year course in Dentistry occurred in the year 1915-16 at Minnesota. The establishment of this course, in the face of the opposition inevitable to any attempted step forward, marks an epoch in the history of dental education. It will prepare for service men of wider attainments, capable of solving problems outside the narrow limits of mere technique. It will lessen the deplorable gap between the training of the dentist and the physician, making possible joint effort in the wide field of bacterio-pathological research and therapeusis.

Research.—Notable results in research have been reached through the work of Doctors Hartzell, Henrici, and Dahlgren with members of the Department of Bacteriology and Pathology and of the Department of Medicine in the Medical School. This joint research work in Bacteriology and Pathology has resulted in a remarkable readjustment of clinical practice, which has now to meet the challenge of the microscope, the X-ray, and the test-tube.

Summer School.—The increased attendance at the Summer School indicates the growing importance of this phase of the college work. During the summer of 1916, seventy-five students were registered.

Foreign students.—It is interesting to note that among the students enrolled in 1915-16 there were eight from foreign countries. The class of 1916 returned two graduates to their homes in Norway and Germany.

Respectfully submitted,

ALFRED OWRE, *Dean*

THE COLLEGE OF PHARMACY

To the President of the University:

SIR: I herewith submit my report for the University year 1915-16:

Registration.—The College of Pharmacy completed its twenty-fourth year on July 31, 1916. The University commencement in June was the twenty-third of the College. Thirty-one students graduated: twenty-nine from the regular course and two from the Master's course. Of these one student received his diploma (Phm.G.) in September, 1916. The total registration during the year reached 105: 64 first year, 39 second year, and 2 graduate students. The total enrollment of last year was 101, of the year before 98, and of the year preceding that 86. The larger enrollment the past three years is largely due to the increase by one year of the regular course to go into effect 1916-17 and included those students who wanted to complete the course in two years.

During the year thirteen students discontinued: four for financial reasons; one because of ill health; eight for various but sufficient reasons. The faculty gave instruction to a total of 176 students including 71 Medical students. Several lectures on medicinal plants were given to high-school students and nurses.

Geographical distribution of students.—The student body represented the following political divisions: Turkey, 1; Iowa, 1; Minnesota, 92; Montana, 1; North Dakota, 2; South Dakota, 3; West Virginia, 1; Wisconsin, 4. Minnesota counties: Anoka, 2; Big Stone, 1; Blue Earth, 1; Brown, 1; Carleton, 1; Carver, 2; Cottonwood, 1; Crow Wing, 1; Douglas, 1; Faribault, 1; Fillmore, 2; Goodhue, 1; Hennepin, 23; Itasca, 2; Kandiyohi, 2; Lincoln, 5; Le Sueur, 1; Lac qui Parle, 2; Marshall, 1; Martin, 2; McLeod, 1; Meeker, 2; Murray, 2; Nicollet, 1; Norman, 2; Olmstead, 2; Otter Tail, 1; Pope, 2; Ramsey, 2; Renville, 1; Rice, 2; Stearns, 1; Steele, 2; St. Louis, 8; Wabasha, 2; Waseca, 3; Washington, 2; Yellow Medicine, 3.

Instruction.—The faculty was still undermanned and one position was again filled only temporarily, but the best instruction possible in the circumstances was given and closely approximated the instruction of the year before. Eight additional work tables were added to the dispensing laboratory. All available space in the dispensing laboratory is now filled and the maximum capacity has been reached. The same is true of all other laboratories in the building. Special lectures were given by Mr. E. A. Tupper, secretary of the State Board of Pharmacy, on "State Pharmacy Laws"; Mr. F. A. Upsher Smith (five lectures) on "Current Pharmaceutical Literature Digests"; Mr. Winthrop G. Noyes on "The Business Side of Pharmacy"; Dr. H. M. Whelpley, Dean of the St. Louis College of Pharmacy, on "Historical Pharmacy" and "The Work of Revising the Pharmacopoeia." Students visited local drug and sundries jobbers, a drug mill, and several dispensing pharmacies and made a

number of botanical trips, always under the guidance and field instruction of a member of the faculty. All students attended the sessions of the Scientific Section of the Minnesota State Pharmaceutical Association held in this city in February.

Faculty changes.—The difficulty of obtaining suitable men as teachers in pharmacy is increasing to an alarming extent. The pharmaceutical manufacturers are in open competition for the good men and because of the higher salaries offered secure them. For this reason the two vacancies in the faculty could not be filled, except that one was filled temporarily by Mr. Charles W. Wulling. That the present faculty is loyal to the College is evidenced by the fact that one member declined an attractive offer from a publishing firm and another member three offers, one from a large manufacturing house at an advance of $1,750 above his present salary, one from an influential trustee of an eastern college of pharmacy, and another from an eastern banking institution at advances of respectively $1,000 and $750 over present salary. Because of their heavy college work members had to decline to do research work in connection with the manufacture by local and eastern manufacturers of some of the finer chemicals heretofore imported. This kind of pressure upon recognized members of the faculty is likely to continue and must sooner or later be taken into consideration in the budget-making.

Free dispensary drug room.—During the year 18,324 prescriptions were dispensed, as against a total of 19,997 the year before and 18,797 the year preceding that. The decrease was due to the removal of the dispensary to its new location. The prescriptions were dispensed by the senior pharmacists under Instructor Blosmo's direction and supervision.

Outside activities.—The outside demands upon faculty members is growing unduly. Many of these demands must be met. Among the most important of these activities may be mentioned: presidential address, American Conference of Pharmaceutical Faculties; address before the California State Pharmaceutical Association; commencement address, University of Illinois College of Pharmacy; twenty-two other addresses and papers before state and national associations and locally; four exhibits of medicinal plants and their pharmaceutical preparations and photographs, (Philadelphia, Atlantic City, St. Paul, Minneapolis); identification of about twenty specimens of medicinal or supposedly medicinal plants, chiefly from Minnesota; work on standards for vegetable drugs of National Formulary, including proof-reading of final copy; advice and suggestions to many on medicinal plant culture; coöperation in completing U. S. Pharmacopoeia monographs on vegetable drugs; the formulation and conduct of the proceedings of the Scientific Section of the Minnesota State Pharmaceutical Association; presiding at the San Francisco meeting of the American Conference of Pharmaceutical Faculties and at joint meetings with the National Association of Boards of Pharmacy and with the American Pharmaceutical Association; testing for purity and strength 41 pharmaceutical chemicals and preparations for report to State Association and State Board; giving frequent advice on

difficult prescriptions and formulae; inspecting (during the summer months) for the State Board of Pharmacy 186 drug stores and 42 general country stores where drugs in packages put up by registered pharmacists are sold, in 153 towns in Minnesota; advising and instructing pharmacists in most of these 186 stores; advising and instructing officers and members of nine state and national associations and colleges in matters connected with legislative, educational, associational, and other matters.

Important offices held by faculty members.—The presidency-elect of the American Pharmaceutical Association; vice-presidency, Minnesota Academy of Sciences; secretaryship of the Minnesota State Pharmaceutical Association and of the Northwestern Branch of the American Pharmaceutical Association; membership in the Council of the American Pharmaceutical Association and on the Committee on Publication; chairmanship of or membership in twelve important associational committees; etc.

Respectfully submitted,

FREDERICK J. WULLING, *Dean*

THE SCHOOL OF MINES

To the President of the University:

SIR: I herewith submit my report for the University year 1915-16.

Registration.—The total registration during the year was seventy-six distributed as follows:

Seniors	11
Juniors	15
Sophomores	26
Freshmen	17
First year students	7
Total	76

Geographical distribution of students.—The above students were registered from Minnesota counties as follows:

Aitkin	1	Otter Tail	2
Brown	1	Pope	1
Crow Wing	2	Ramsey	17
Fillmore	2	St. Louis	5
Hennepin	26	Stearns	2
Jackson	1	Wadena	1
Morrison	1	Washington	1

Students registered also from outside the state as follows:

Arizona	1	New York	1
North Dakota	2	Wisconsin	4
New Jersey	1	China	4

Withdrawals.—During the year seven students withdrew. These students were distributed by classes as follows:

Seniors	0
Juniors	1
Sophomores	3
Freshmen	3
First year students	0
Total	7

The reasons for such withdrawals are as follows:

Deficient	2
Financial	1
To schools and colleges outside the University of Minnesota	1
To schools and colleges within the University of Minnesota	2
Unknown	1
Total	7

The curriculum.—Ore dressing, which was formerly under the jurisdiction of the Department of Mining, was transferred to the Department of Metallurgy for the purpose of coördinating the work of ore testing and ore dressing.

The rapid changes in metallurgical practice emphasized the necessity of devoting more time to strictly professional work. To accomplish this the time formerly devoted to special chemical problems was divided equally between ore testing and theses.

On account of the quantity and character of our work it has been most difficult to provide for compulsory military drill. It is unreasonable to expect students with already heavy programs to meet this additional requirement, and a further decrease in attendance may be expected.

The School of Mines Building.—Classes occupied the new building for the first time in September, 1915. The building meets most admirably the present needs of the departments occupying it. There has been a marked improvement in attitude and character of the work of the students and greater efficiency noted on the part of the faculty since permanent quarters have been provided.

Federal Bureau of Mines.—As the result of a visit of the President to Washington, the Secretary of the Interior and the Director of the Federal Bureau of Mines issued a statement saying that we could confidently expect Congress to make appropriations for three federal mining stations for the coming year and that Minnesota would be designated as the station for the Lake Superior district. The federal appropriation will be $25,000 a year but can not be used for buildings and equipment. The Station will be located at the University of Minnesota and coöperation will be effected with the Minnesota School of Mines and the State Mining Experiment Station.

The State Mining Experiment Station.—During the period covered by this report 196 tests were made as against 147 of the preceding year. The work included assaying samples for gold and silver. One hundred nineteen samples required only sight examinations or blow pipe tests. Many citizens took advantage of the privilege of appearing in person, submitting their samples, and receiving professional advice.

The following concentration tests were made:

Company	Mine	Range	Weight of sample Pounds
J. F. Menshel	.....	.....	10
Interstate Iron Company	Lincoln	Mesabi	2,000
Inland Steel Company	Thompson	Cuyuna	1,000
Joseph Hyman	Buckeye	Mesabi	6,000
E. P. McCarty	Wilcox	Cuyuna	60
Interstate Iron Company	Stein & O'Rourke.	Mesabi	14,000
Interstate Iron Company	Snyder Lease.....	Mesabi	11,000
Minnesota Survey	Titaniferous	Cook & Lake	350
Wisconsin Survey	.....	Geological....	14,000
W. G. Swart	Eastern Mesabi...	Mesabi	100,000
Onahman Iron Company	Ferro	Cuyuna	500
H. A. Brassert	.....	Cuyuna	150
Cuyuna Mille Lacs	.....	Cuyuna	500

The quantity of material concentrated and the time required for making the tests exceeded the record of previous years. Considerable attention was given to improving working conditions at the plant and carrying on preliminary investigations of promising problems.

Eastern Mesabi magnetic ores.—Arrangements were made for carrying on extensive tests at the Station with Mr. W. G. Swart, who is in charge of the experimental work on the magnetic ores of the Eastern Mesabi, for certain interests. Mr. Swart installed for special use a four-foot Hardinge mill, and small Door and Richards-Janney classifiers. These machines were donated to the station. A special feature of these tests was the study of the best operating conditions for the magnetic log washer, a machine developed at our station and referred to in my last report.

Wisconsin Geological Survey.—The Wisconsin geological survey desired to investigate the possibilities of concentrating some of the low-grade material existing on the Gogebic range of Wisconsin. At the request of Mr. W. O. Hotchkiss, Director of the Survey, coöperation was effected and the tests made at the Station. Much time was devoted to this work but the tests were particularly valuable to our staff as giving them opportunity to study and acquaint themselves with iron ore problems other than those of Minnesota.

Minnesota Geological Survey.—Our state survey is working on the geology of the titaniferous iron ore deposits of Cook and Lake counties. Small samples were submitted to us for the purpose of determining whether the grade could be improved by metallurgical treatment. Later when the survey has mapped the deposits large samples will be taken for final testing.

Cuyuna manganiferous iron ores.—On account of the unusual situation occasioned by the European war and the scarcity of manganese-bearing material, it seemed desirable for the Experiment Station to investigate the present and future economic possibilities of the manganiferous iron ores of the Cuyuna range. This investigation is well under way and a bulletin containing technical as well as economical and statistical information will be published shortly.

New Testing Building.—Much time has been spent in preparing plans for a new testing building with a view to housing suitably the Federal Bureau of Mines Experiment Station when the Government appropriation is available. The plans are tentative and subject to revision after consultation with the Director of the Bureau of Mines. They meet the requirements for up-to-date processes and provide for the most economical arrangement of modern machinery.

Publications.—Bulletin No. 4, *Bibliography of Minnesota Mining and Geology,* by Winifred Gregory, has been published and is well received. The maps of the Iron Mining Districts of Minnesota compiled by Elting H. Comstock have been brought up to date and show the location of the important iron ore properties on the ranges. They are still in great demand.

Service to Tax Commission.—The work of making ore estimates for the Minnesota Tax Commission begun in June, 1909, still continues. The ore estimates are used as a basis for the valuation of mineral properties

in the State of Minnesota. The total number of properties reported on between October 1, 1914, and September 1, 1916, is 167. One hundred of these show an increase of 58,461,629 tons and forty-five show a decrease of 11,589,402 tons. There is a net increase in tonnage of 46,872,227 tons. No change has been made on the remaining twenty-two properties. Preliminary reports have been made on a number of properties, which have not yet been submitted in the form of a final estimate. In addition, 337 properties have been mapped and reported from drill records. They have so far developed little or no ore.

Technical information has been furnished the commission in a number of instances where tonnages were not in question.

Fifteen trips were made to the Mesabi, Vermilion, and Cuyuna Ranges, requiring eighty-five days of actual field work for two men. The mileage covered in this field work amounted to 7,610 miles.

Future needs.—Equipment for the new building should be provided in the immediate future. The uncompleted wing of the building which is to house the Department of Geology and Mineralogy should receive prompt consideration and the building be completed as soon as possible.

A new testing works must be built and special equipment furnished if coöperation is to be effected with the Federal Bureau of Mines.

The wisdom of offering work in metallography has been shown by the attendance of a large number of graduate and undergraduate students. The lack of adequate assistance and necessary apparatus will seriously retard the development of this important work unless relief is promptly given.

Respectfully submitted,

W. R. APPLEBY, *Dean*

THE SCHOOL OF CHEMISTRY

To the President of the University:

SIR: Herewith is submitted my report for the School of Chemistry for the year ending July 31, 1916.

The Chemistry Building.—The Chemistry Building, located on the new campus, is in the same unfinished condition indicated in my last report to you. In this last report, it was pointed out that all of the materials, desks, tables, hoods, cupboards, and cases from the old laboratories not destroyed by acids were being installed in the new laboratory. In only two laboratory rooms in the whole building were new laboratory tables used. Several of the smaller laboratories had to be left in an unfinished condition on account of lack of funds. Since this last report was placed in your hands a small appropriation has been granted by the Legislature for equipment. At the present time all of the available space in the building is in use, altho much work is yet to be done in the way of plumbing, ventilation, hoods, installation of special apparatus, etc., in order to make the laboratory most convenient and efficient.

The General Laboratories.—Substantial improvements have been made in the general laboratories. Most of the students who have registered for general and qualitative analysis have been supplied with individual locker desks and the necessary apparatus and chemicals. The most important additions to these laboratories, besides the individual lockers and sets of apparatus, are the students' reagent bottles. These individual sets of reagents have greatly improved the quality of the work, especially in qualitative analysis. Unfortunately, these large laboratories are crowded; some of the students in the main laboratory have no regular laboratory locker desks and have been compelled to use small boxes for preserving their apparatus, chemicals, and problems.

The Organic Laboratory.—The organic laboratory, as indicated in the original plans for the new building, is located in the southwest quarter, or the part of the building left out on account of lack of funds. A temporary organic laboratory was therefore installed in the basement, originally intended for storerooms and technical laboratories. It was thought at the time of its installation that it would accommodate the organic students for some time to come. The unexpected increase in the number of organic students due to the increase in the regular organic classes, and especially to the introduction of organic chemistry, in some of the professional schools, as for example, Dentistry, has made it absolutely impossible to accommodate all the students in this temporary room. A large number of organic students are now working in the quantitative laboratory, a necessary but unfortunate arrangement.

The Research Laboratories.—Every research room available is now partially equipped and occupied, notwithstanding the fact that some of the graduate students have been forced to do a part of their work in the regular technical laboratories.

Industrial Chemistry.—The demand for industrial chemistry has been so imperative that whatever funds were available after supplying the wants of the regular students have been spent in improving the industrial laboratories. One of the most crying needs at the present time is for better and more efficient industrial work. While we have added to the equipment just as far as the funds available would permit, much is yet to be done in the way of installing working unit apparatus.

Students.—There has been a material increase in the number of students taking chemistry since my last report to you. While the increase in the number of students taking the general courses has not been large, there has been a material increase in the advanced students from the various colleges. The most notable increase, however, has been in the School of Chemistry. The lower classes have been nearly trebled in the last year.

Research work.—Most of the lines of research given in my last report have been continued in addition to a number of new lines of work.

Respectfully submitted,

GEORGE B. FRANKFORTER, *Dean*

THE COLLEGE OF EDUCATION

To the President of the University:

SIR: I herewith submit my report as Dean of the College of Education for the year ending July 31, 1916.

The College of Education registers: (1) students who have completed at least the freshman and sophomore years of the College of Science, Literature, and the Arts, or some other college at the University of Minnesota or elsewhere; (2) graduates of the advanced course of approved normal schools, to whom it grants sixty credits of advanced standing; (3) graduate students; (4) unclassed students, chiefly teachers who are engaged in service and who do not yet possess a bachelor's degree.

At the annual commencement, June, 1916, 31 students were graduated from the College of Education. The total registration for the year amounted to 106.

The following shows the registration for the years 1914-15 and 1915-16.

TABLE I. REGISTRATION IN THE COLLEGE OF EDUCATION

	1914–15	1915–16
Juniors	30	39
Seniors	41	41
Graduate students	14	14
Unclassed	20	12
Total	105	106

Registration according to courses.—The total number of registrations in all courses amounted to 931, distributed as follows: History of Education, 227; Technique of Teaching, 155; Social Aspects, 182; Practice Teaching, 137; Educational Psychology, 20; Educational Diagnosis, 12; Mental Diagnosis, 24; Theory of Supervision, 15; Methods of Educational Research, 3; Educational Administration, 12; School Curricula, 7; School Sanitation, 44; School Organization and Administration, 14; Problems of Elementary Education, 17; School Supervision, 16; Mental Tests, 6; Industrial Education, 15; three seminar courses, 25.

The total registration in all classes in Education in the Summer Session of 1916 amounted to 667.

Registration—sources of enrollment.—Students registered in the College of Education come chiefly from the following sources: (1) from colleges within the University of Minnesota; (2) from colleges outside the University of Minnesota; (3) from normal schools; (4) from theological schools. Table II shows the students classified on the basis of these types of institutions.

TABLE II. INSTITUTIONS FROM WHICH COLLEGE OF EDUCATION STUDENTS CAME, 1915-16

1. Colleges of the University of Minnesota	
Science, Literature, and the Arts	35
Engineering	1
	36
2. Colleges outside the University of Minnesota	
Ames, Iowa	1
Columbia University	1
Dakota Wesleyan	1
Berea College	1
Augsburg Seminary	1
St. Olaf	2
Hamline	2
St. Clara College	1
University of Chicago	1
University of Illinois	1
University of Utah	1
Upper Iowa University	1
Wheaton College	1
	15
3. State Normal Schools	
Winona	12
Moorhead	4
Mankato	10
St. Cloud	8
Duluth	3
	37
4. Graduates of Normal Schools outside of Minnesota	
Westchester	1
Oswego, N. Y.	1
Nebraska	2
Valley City, N. D.	1
Whitewater, Wis.	1
River Falls, Wis.	2
Madison, S. D.	1
Superior, Wis.	1
Buffalo, N. Y.	1
Spearfish, S. D.	1
Aberdeen, S. D.	1
Warrensburg, Mo.	1
Northern Normal	1
	15
5. St. Paul Normal School	2
6. High School (Unclassed students)	1

Professional training for students in other colleges.—The College furnishes instruction and training for an increasing number of students registered in other colleges in the University of Minnesota and in the Extension Division.

Extension and Correspondence Courses	220
College of Agriculture	38
College of Science, Literature, and the Arts	649
College of Education	175

Graduate Students	68
Law School	1
Special (Teachers Greely School)	15

Practice Teaching.—Last year there were enrolled in Practice Teaching 134 people, 67 of whom did their practice work in the city schools. The agreement under which the University is permitted to assign these students to practice teaching in the city schools is one of reciprocal benefit. The University grants to the city school teachers as many free scholarships in regular University enrollment as there have been practice teachers assigned in the city schools. When this plan of operation was begun a Joint Committee from the city schools and the University compiled a pamphlet containing recommendations concerning practice teaching.

Superintendents' and Principals' Short Course.—The College of Education, in conjunction with the State Department of Education, offered at the University during the spring meeting of the Superintendents' section of the Minnesota Educational Association, April 19 to April 22, a third annual short course for city and county superintendents, and high-school and graded-school principals. The total registration for the Short Course was approximately 400. Addresses were delivered by Professor W. C. Bagley, School of Education, University of Illinois, and Mr. E. P. Cubberley, Professor of Education, Leland Stanford Junior University.

On Tuesday and Wednesday, April 18 and 19 preceding the Short Course, a conference of high school teachers of English and Commercial Subjects was held. The sessions were very well attended.

Changes in organization.—In June, 1916, the Board of Regents adopted the following resolutions regarding the organization of the College of Education:

1. Teacher training is a function of the University and not of any one college or department.

2. The College of Education is the University organ upon which responsibility for teacher training is placed.

3. Teacher training has two aspects: (a) preparation in subject matter; and (b) professional training, (1) general courses in education, (2) special courses adapted to different subjects.

4. Decisions as to *proficiency in subject matter* of a candidate for teaching shall rest with the college or department immediately responsible for the subjects involved.

5. All instructors and courses of a professional character, whether general or special, shall be instructors and courses in the College of Education, which shall assume administrative responsibility in the usual acceptation of the term; that is, for recommending appointments, promotions, and increases in salary, supervision of work, etc., etc.

6. The appointment, promotion, and increase in salaries of instructors who teach special training courses shall be with the knowledge and consent of the departments immediately responsible for the subject matter involved.

7. All candidates for teaching shall be certified by the College of Education, such certification to be based upon: (a) the approval for subject matter by the departments concerned, (where such a department exists in the College of Education), (c) the recommendation of the Executive Committee or Faculty of the College of Education.

8. The recommendation of candidates for teaching positions shall be a University function, administered by a Bureau under a Senate committee with an Executive Secretary. This bureau shall maintain a record of all positions filled so that there shall be available in one place a complete list of all graduates who are in teaching positions. This is not to be construed as preventing the delegation to one or more different officers the function of conducting correspondence with regard to special classes of positions and applicants. When this is done duplicate records are to be supplied to the Central Bureau to complete the general record.

9. So far as possible the salary budgets of the various departments and of the College of Education shall reflect approximately the distribution of duties and responsibilities of the individuals concerned. When a special department exists in the College of Education, the usual departmental organization, appropriations for supplies, etc., are to be provided.

Granting Certificates.—The Executive Faculty of the College of Education adopted the following important regulations governing the issuance of certificates:

1. All inexperienced students desiring the University Teachers' Certificate are required to comply with the University requirements for this certificate. This certificate shall specify the major and minor subjects the student is qualified to teach.

2. Mature and experienced undergraduates may petition the Administrative Board to be excused from certain of the prescribed courses for the regular University Teachers' Certificate, but their petition must be approved by the Department of Education and the petition must be accompanied by a statement showing that the student has been a successful teacher in certain high school subjects. These students will be required to complete satisfactorily prior to graduation at least fifteen hours of work in education. The education courses which they shall be privileged to carry will be determined entirely upon the recommendation of the Dean of the College of Education or the Department of Education.

3. Graduates of normal schools or of other institutions registered in the College of Education who do not desire to become high school teachers, but who desire a more liberal training for elementary school work, may be relieved from complying with the regular requirements for a University Teachers' Certificate, but they will not be relieved from carrying at least fifteen hours of work in education. Such persons at graduation will be granted a special teachers' certificate describing their courses and indicating the types of positions for which they are qualified.

4. Students desiring to qualify as public school administrators will be granted a certificate upon completion of a course leading to such a certificate, but no student shall be eligible to such a certificate unless he has completed at least twenty-four hours of work in education, at least twelve of which must have been taken at the University of Minnesota.

5. Teachers and supervisors of public school music, of physical education, of manual training, of home economics, of agriculture, and of such special subjects as may later be included in the program of the College of Education will be granted a special teachers' or supervisors' certificate upon completing a prescribed course leading to such a certificate.

6. Students desiring to qualify as heads of teachers' training departments in high schools will be granted a certificate upon the completion of a course leading to such a certificate.

7. Students desiring to qualify as teachers of defective or supernormal children will be granted a certificate upon completion of a course leading to such a certificate.

8. School doctors, school dentists, and school nurses will be granted a special certificate upon completion of courses designed to prepare for these special kinds of educational work.

9. Students regularly enrolled for graduate work with education as a major shall, upon the completion of the requirements for an advanced degree, be recommended for a University Teachers' Certificate.

10. Students regularly enrolled for graduate work with education as a minor, who desire a University Teachers' Certificate shall be required to complete the course prescribed for such a certificate, unless they have already met the requirements or their equivalent for the certificate in their undergraduate careers.

Appointment Bureau.—The Appointments work was completely reorganized and placed in charge of a Senate Committee consisting of L. D. Coffman, Chairman, Professors Brooke, Krey, Lusk, and Dean Frankforter. The final report of this Committee filed with a committee of the Senate shows:

Number of requests for teachers	258
Positions filled	49

Of the 31 graduates of the College of Education, 20 have secured positions as follows: superintendents, 2; graded school principals, 4; high school teachers, 12; grade work, 1; normal training teachers, 1.

Changes in staff.—The most important change in the personnel of the College of Education was the appointment by the Board of Regents of Dr. M. E. Haggerty of the University of Indiana as Professor of Educational Psychology. The College lost Prof. Raymond A. Kent, who was appointed Superintendent of City Schools at Lawrence, Kansas, and Professor of Education in the University of Kansas; and Mr. Charles Pieper, who was made head of the Science Department in the University High School, University of Chicago. Mr. W. S. Miller of the University of Illinois was appointed as Mr. Kent's successor, and Mr. S. R. Powers, head of the Science Department of the High School at Terre Haute, Indiana, as Mr. Pieper's successor.

Needs of the College.—In the report of the College of Education for the year 1914-15, attention was called to the need of a department for training commercial teachers, the development of a department of high-school normal training, the need of practice-teaching opportunities in other than Minneapolis Schools, better courses in methods of teaching high-school subjects and the placing of these courses in the hands of instructors actually teaching in the University High School, and the addition to the college staff of a professor of secondary education and professors of a number of other professional branches.

A greatly increased budget imperative.—The statement made last year still holds, that the budget of the College of Education, if compared with other colleges, suggests little more than a poorly supported department, and that a greatly increased budget is absolutely imperative if the College is to fulfil its mission to the state and to its schools.

Respectfully submitted,

LOTUS D. COFFMAN, *Dean*

UNIVERSITY HIGH SCHOOL

To the President of the University:

SIR: I beg to submit herewith a brief report of the University High School for the year 1915-16.

Enrollment.—The total enrollment was one hundred and two, seventy-three boys and twenty-nine girls. The enrollment by classes was as follows:

Freshmen			Juniors		
Boys	24		Boys	12	
Girls	8		Girls	2	
		32			14
Sophomores			Seniors		
Boys	21		Boys	15	
Girls	5		Girls	11	
		26			26
Total					98

Diplomas were given in June to twenty-one graduates, nine boys and twelve girls.

Student body.—The enrollment in the University High School has not increased materially during the last year. This is due to the fact that it has been necessary to deny certain classes of students admission to the University High School. Students who were over twenty-one years of age, those who were unable to carry work in other high schools, and those who desired to use the high school simply as a place to go to, but who had no desire to study, were either prohibited from entering the University High School or from continuing in it. These restrictions, however, have resulted in an improvement in the personnel of the student body of the University High School.

Tuition fee.—In order to provide supplies, equipment, and additional instruction, the Board of Regents provided for the assessment of a tuition fee of $5 and an incidental fee of $1.50 each semester to be collected from each pupil, beginning with the school year 1916-17. In voting the tuition fee, the Board of Regents provided for a limited number of service scholarships which exempt the holder from the payment of all tuition fees.

Instruction.—The University High School has been fortunate in having a very able teaching staff. Members of this staff have devoted themselves to the study of methods relating to the teaching of their various subjects. In the courses in government and economics, one day each week has regularly been devoted to laboratory work. The government class has visited county, state, and government centers, while the economics class has visited every type of major industry operating in Minneapolis. In mathematics, an attempt has been made to unify the work in algebra and geometry. In both Latin and German, there has been an attempt to standardize and to vitalize the instruction. Classes in oral

English were provided by Professors Rarig and Gislason of the Rhetoric Department. The science department has introduced a year course in general or elementary science which is required of all freshmen. Shop work has been reorganized, standardized, and encouraged. For the first time it is now on a respectable basis. Household science had not received the attention it deserves.

Practice Teaching.—During the first semester there were enrolled 27; the second semester 107. Four of these dropped out of the course, one the first semester and three the second semester. They were assigned to do work in the University High School and the city high schools. During the first semester fifteen did their practice teaching in the University High School, ten in the City High Schools, and one in the University Botany Department. During the second semester 57 did their practice teaching in the University High School, 41 in the City High Schools, and six in the University Botany Department.

Needs.—A larger instructional force is needed. The Science Department and the Manual Training Department are overcrowded. More and better equipment should be purchased for both of these departments. Additions should be made to our curriculum in biology, commercial subjects, art, music, and physical training. The School needs to have a larger budget to enable it to maintain normal standards of high-school work. The greatest single need outside of finances is physical training for both the boys and the girls. Such opportunity is at present practically denied them, since there is no gymnasium in the high school building and since overcrowded conditions in the university gymnasium make it impossible for them to get regular work there.

Respectfully submitted,

RAYMOND A. KENT, *Principal*

THE GRADUATE SCHOOL

To the President of the University:

SIR: I beg to submit herewith my annual report as Dean of the Graduate School. This report covers the year from August 1, 1915, to July 31, 1916. As in the two preceding reports, a table of statistics is given first as a summary and as a basis of further comment.

REGISTRATION 1911-16

Year	Graduate study	Master	Doctor	Men	Women	Totals
1911	68	60	18	96	50	146
1912	54	84	21	101	58	159
1913	52	103	28	114	69	183
1914	10	123	42	118	57	175
1915	22	159	56	160	77	237
1916	31	206	139	270	106	376

GRADUATE STUDENTS DOING FULL OR PART TIME WORK

	Full time	Part time	Total
Men	154	116	270
Women	39	67	106
Total	193	183	376

DISTRIBUTION ACCORDING TO YEARS OF GRADUATE WORK DONE

First year	Second year	Third year	Fourth year and over
243	94	27	6

MEMBERS OF THE STAFF REGISTERED IN THE GRADUATE SCHOOL

	Men	Women	Total
Instructors doing graduate work*	39	2	41
Graduate students serving as assistants	49	5	54
Graduate students holding scholarships	19	18	37
Teaching fellows	75	4	79
Total			211

* Six Assistant Professors.

GRADUATE STUDENTS MAJORING IN DIFFERENT DEPARTMENTS

Department	Men	Women	Total
Agricultural Chemistry	11		11
Agricultural Education	4		4
Agronomy	1		1
Anatomy	12	1	13
Animal Biology	6	1	7
Astronomy	1		1
Bacteriology	2	3	5
Botany	7	1	8
Chemistry	28	1	29
Comparative Philology	1	1	2
Economics	19		19
Education	23	9	32
English	8	29	37
Entomology	1		1
Farm Management	3		3
Geology	5		5
German	4	10	14
History	12	17	29
Home Economics		2	2
Horticulture	3		3
Latin	1	5	6
Mathematics	3	2	5
Medicine	11		11
Metallography	1		1
Obstetrics	1		1
Ophthalmology	5		5
Pathology	1	3	4
Pediatrics	2		2
Plant Pathology	6		6
Physiological Chemistry	1		1
Physics	4	1	5
Physiology	4	1	5
Political Science	8		8
Philosophy and Psychology	5	1	6
Rhetoric	1	4	5
Roentgenology	1		1
Romance Language	5	5	10
Scandinavian	4	1	5
Sociology and Anthropology	8	8	16
Soils	5		5
Structural Engineering	1		1
Surgery	41		41
Total	270	106	376

EDUCATIONAL INSTITUTIONS REPRESENTED IN GRADUATE SCHOOL*

Albert Lea	1	Cornell	3
Alma College	1	Dakota Wesleyan	2
Ames	1	Dartmouth	1
Atlanta	1	Dennison	2
Augustana	2	Denver	1
Baker University	1	Des Moines	1
Baldwin	1	Dickinson	1
Bates	1	Earlham	1
Beloit	4	Edinburgh	1
Bethany	2	Florida	1
Bombay	2	Genoa	1
Brown	1	George Washington University	1
Carleton	2	Gustavus Adolphus	3
Catholic University	1	Hamline	4
Chicago	9	Harvard	4
Clemson College	1	Highland College	1
Colorado	3	Illinois	2
Columbia	8	Indiana	3
Concordia	3	Iowa	7

* In cases where the rating of the college is low the students' entry blanks show extra undergraduate work here or at other institutions or tested qualifications in their major work.

Iowa State College	1
Johns Hopkins	1
Kansas	4
Kansas State Agricultural College	1
Knox	1
Lenox	1
Louisiana	1
Louisville	1
Ludwig	1
Luther College	1
Macalester	9
Marquette	1
Miami	1
Michigan	5
Minnesota	133
Missouri	7
Morningside	1
Mount Holyoke	2
Nashville	1
Nebraska	7
New York	1
New York Medical College	1
North Carolina	1
North Dakota	4
North Dakota Agricultural College	1
Northwestern	8
Oberlin	3
Ohio	3
Oklahoma	1
Ottawa	1
Otterbein	1
Pennsylvania	9
Pennsylvania State College	1
Purdee	1
Radcliffe	1
St. Catherine	4
St. Olaf	8
St. Petersburg	1
St. Thomas	1
Smith	2
South Dakota	2
Tarkio, Missouri	1
Tennessee	1
Texas	1
Toronto	1
Trinity	1
Tufts	1
Union College, Nebraska	2
Upper Iowa	1
Ursinus College	1
Utah	1
Utah Agricultural College	1
Valparaiso	2
Vanderbilt	1
Virginia	4
Virginia Medical College	1
Wabash	1
Wartburg	1
Washington	1
Washington State College	1
Washington and Jefferson	1
Wells College	2
Wellesley	5
Western Medical College	1
Williams	1
Wisconsin	15
Wittenberg	3
Wooster College	1
Worcester Polytechnical College	1
Yale	2
Total colleges represented	109
Minnesota registration	133
Total registration from other colleges	243
Total registration	376

MASTER'S DEGREES GRANTED IN 1916, BY DEPARTMENTS

Department	Minnesota graduates		Other colleges		Totals		
	Men	Women	Men	Women	Men	Women	Total
Agricultural Chemistry	..	..	2	..	2	..	2
Agricultural Education	..	..	1	..	1	..	1
Agronomy	2	..	..	..	2	..	2
Anatomy	1	..	1	..	2	..	2
Astronomy	1	..	..	..	1	..	1
Animal Biology	..	1	..	..	..	1	1
Chemistry	4	..	..	..	4	..	4
Comparative Philology	..	..	1	..	1	..	1
Economics	4	..	5	..	9	..	9
Entomology	..	..	1	..	1	..	1
English	..	1	..	3	..	4	4
Farm Management	..	..	1	..	1	..	1
Geology	1	..	..	..	1	..	1
History	1	1	1	4	2	5	7
German	..	..	2	..	2	..	2
Latin	..	1	..	..	..	1	1
Mathematics	..	..	1	..	1	..	1
Pediatrics	1	..	..	..	1	..	1
Physiology	..	..	1	..	1	..	1
Plant Pathology	1	..	..	..	1	..	1
Political Science	1	..	2	..	3	..	3
Rhetoric	..	1	..	..	..	1	1
Romance Languages	..	1	2	2	2	3	5
Soils	..	..	1	..	1	..	1
Sociology	1	..	..	..	1	..	1
Totals	18	6	22	9	41	14	55

Doctors of Philosophy

Paul Henry Mallet-Prevost Brinton, B.S. '12, M.S. '13, Minnesota. Major, Inorganic Chemistry; Minor, Metallography; Thesis: *Contributions to the Chemistry of Beryllium.*

Elmer Ray Hoskins, B.A. '12, Kansas; M.A. '13, Minnesota. Major, Anatomy; Minor, Physiology; Thesis: *The Growth of the Body and Organs of the Albino Rat as Affected by Feeding Various Ductless Glands (Thyroid, Thymus Hypophysis and Pineal).*

Paul Ernest Klopsteg, B.S. '11, M.A. '13, Minnesota. Major, Physics; Minor, Mathematics; Thesis: *A Critical Study of the Theory and Development of Methods of Application of the Open Moving Coil Galvanometer.*

Vaman Ramchandra Kokatnur, B.S. '12, Bombay; M.S. '14, Minnesota. Major, Organic Chemistry; Minor, Geology; Thesis: *The Action of Trioxymethylene on the Various Organic Compounds in the Presence of Aluminum Chloride.*

Frances Helen Relf, B.A. '11, M.A. '12, Minnesota. Major, History; Minor, English; Thesis: *An Interpretation of that Part of the Petition of Right Pertaining to Imprisonment, with a Narrative of the Passage of the Petition through Parliament, and a Discussion of Its Nature as Finally Answered by the King.*

John Ernest Weaver, B.S. '09, M.A. '11, Nebraska. Major, Botany; Minor, Plant Pathology; Thesis: *A Study of the Vegetation of Southeastern Washington and Adjacent Idaho.*

Gilbert Livingston Wilson, B.A. '96, M.A. '99, Wittenberg. Major, Anthropology; Minor, Spanish; Thesis: *The Agriculture of Hidatsa Indians; an Indian Interpretation.*

Shevlin Fellowships 1915-16

Science, Literature, and the Arts: Frederick Gale Tryon, B.A. '14, Minnesota

Agriculture: Arthur von Krogh Anderson, B.S. in Agriculture '13, Minnesota

Medicine: Charles Alden Magoon, B.A. '10, Bates College

Chemistry: Darwin May, B.S. '15, Minnesota

The above statistics show a healthy and satisfactory growth in the registration of the Graduate School. During the three years covering the period of reorganization the registration has risen from a total of 175 to 376. The number of institutions represented in the undergraduate training of this group has risen from 95 in 1913-14 to 109 in 1915-16. Graduates of the University of Minnesota form slightly more than 35 per cent of the registration in our Graduate School. Following our practice, about twenty students, graduates in most cases of acceptable institutions but desiring to take only undergraduate courses, were not admitted to the Graduate School, but registered as special students in the various colleges.

The heading "Members of the Staff Registered in the Graduate School" includes all whose appointment requires the action of the Regents. It really includes two quite different groups: (a) those listed as instructors doing graduate work who are appointed primarily for instructional purposes, a total of 41, and (b) those selected primarily as promising graduate students and incidentally performing varied services for which they receive a stipend. The whole group of 211 matriculants constitute about 56 per cent of our registration. A better view of the constitution of the groups for which the Graduate School is really conducted and who come here primarily for graduate study is obtained by including all but the 41 instructors as primarily graduate students. These 41 regular instructors total only about 11 per cent of our matriculation. A number of these are candidates for degrees at other institutions who are simply taking advantage of the opportunity to do some advanced work with us to be presented elsewhere for credit.

Requirements for degrees.—The most noteworthy change in requirements is the additional requirement of a reading knowledge of either French or German from candidates for the Master's degree, except in departments especially exempted by the Executive Faculty. This requirement must be absolved before the beginning of the second semester.

New work.—The outstanding feature here is the registration of over sixty students with their major work in clinical branches of Medicine and Surgery. Nearly all these students hold fellowships in the Medical School or on the Mayo Foundation. This work is progressing satisfactorily in its present experimental stage. The problems involved now are almost wholly educational and administrative. It would seem at present that the service requirements to which these fellows are held are somewhat too exacting on both campuses, leaving perhaps too little free and undirected time for independent study and research. The existing system of majors and minors may need readjustment with a view to fitting more nearly the purposes of this work. It is possible also that in certain cases a series of brief related studies of a problem, instead of a monograph, may be accepted as fulfilling the thesis requirement. Minor matters of reporting and crediting work done on the quarter basis instead of the semester basis as a unit have no great importance in contrast with the large purpose towards which the work is directed. The whole experiment is one of the most promising in medical education—the only one now in operation upon such an advanced plane. It is commanding general interest in the educational and medical world. Other medical centers are considering the inauguration of similar work and are looking to the University of Minnesota for leadership. At the June meeting in Detroit of the American Medical Association, a paper was read on the Minnesota plan and at the recent meeting of the Association of American Universities at Worcester, Massachusetts, Dr. Howell of Johns Hopkins gave it extended notice as the only thing of its kind now under way. The chief criticism was the use of the degree of Doctor of Science for our graduates, inasmuch as it is now so largely an honorary degree.

Progress and problems.—The development of library and laboratory facilities and the strengthening by new appointments of such departments as Medicine, Animal and Dairy Husbandry, History, English, and Education has increased in a gratifying way our facilities for doing graduate work. The graduate work in Medicine on the Minneapolis campus has necessarily been limited by the hospital and staff strength over which we have teaching control. The task of building up our collection of books still remains one of the central problems and conditions of all our undergraduate and more distinctly of our graduate work. Every resource and every means must be utilized to accumulate a great working collection of books. Our present resources are inadequate in many important fields of study. Progress has been made through the wise use by the Library Committee of $15,000 granted by the legislature as a special fund for sets and larger works and runs of periodicals. War conditions have not resulted in a decline in book prices, but rather an advance, and shipping conditions arising out of the blockade have made it impossible to enter the larger book markets of central Europe. The failure to receive scientific periodicals and the suspension of others is a matter of serious concern in a number of fields.

The present library building is so utterly inadequate as a working place for all types of students, especially those desiring to pursue research, that the question of a more adequate housing of our present book collections can not be postponed much longer. When the planning of a new building is studied, the needs of graduate students and instructors for working space, seminar rooms, and studies must be taken into account.

Research and publication.—It is a source of gratification to record our steady activity in the field of publication in the Research Publications. Since my last report the following have appeared:

Studies in the Social Sciences

6. Albert Ernest Jenks. Indian-White Amalgamation: An Anthropometric Study. March, 1916.

Studies in Language and Literature

2. Elmer Edgar Stoll. *Othello:* An Historical and Comparative Study. March, 1915.

3. Colbert Searles. *Les Sentiments de l'Académie Française sur le Cid.* Edition of the Text, with an Introduction. March, 1916.

Current Problems

6. Joseph B. Pike. Bulletin for Teachers of Latin. October, 1915.
7. August C. Krey. Bulletin for Teachers of History. October, 1915.
8. Carl Schlenker. Bulletin for Teachers of German. August, 1916.

In press are the following issues:

Studies in the Social Sciences

7. Cephas D. Allin. A History of the Tariff Relations of the Australian Colonies.

8. Frances H. Relf. The Petition of Right.

9. Gilbert L. Wilson. Agriculture of the Hidatsa Indians: An Indian Interpretation.

10. Notestein and Relf, *Editors*. Commons Debates for 1629.

Studies in Language and Literature

4. Paul Edward Kretzmann. The Liturgical Element in the Earliest Forms of the Medieval Drama.

5. Arthur Jerrold Tieje. The Theory of Characterization in Prose Fiction prior to 1740.

Several other manuscripts have been submitted and we could easily well use more than the $4,000 now annually set aside for this work.

Allotments from the research funds have been made during the past year to the following persons for the purposes stated with results as here summarized:

Clarence M. Jackson. Effect of inanition upon white rats of various ages. $250 for assistant. Work of previous year completed and two papers published; other investigations to be continued.

Edgar D. Brown. Research in pharmacology. $50 for materials. Investigation completed and two papers published in the *Journal of Pharmacology and Experimental Therapeutics.*

Hardin Craig. Compilation of the history of English literature in the eighteenth century. $50 for assistant.

Hal Downey. Investigation of blood-forming organs and connective tissues. $250 for assistant. Publication in foreign periodicals delayed on account of the war. Work to be continued next year.

Henry A. Erikson, et al. Change in the mobility of the positive and negative ions with temperature in different gases and different stages of purity; mobility of the ions at high temperatures; ionization due to a single *Beta*-particle using the counting method (A. F. Kovarik and L. W. McKeehan); production of *Beta*-rays by *Gamma*-rays (A. F. Kovarik). $500 for assistant. One paper published (by Kovarik).

William Stearns Davis and Albert B. White. History of the Roman Empire (Mr. Davis); parliamentary beginnings in the twelfth century (Mr. White). $350 for assistants. First draft of manuscript of Mr. Davis' book completed. One paper by Mr. White has appeared in the *American Historical Review*, another ready to go to press.

Samuel L. Hoyt. Copper-rich kalchoids. $300 for assistant. Work to be continued next year and two papers published.

Arthur D. Hirschfelder. Pharmacology of infections, diseases, and allied subjects. $450 for assistants and materials. Part of study completed: three papers have been published and one is now in press.

Richard E. Scammon. Study of the development of the pancreas in lower vertebrates. $250 for assistant. Study finished and two papers ready for publication.

Albert E. Jenks. Studies in the heredity of certain variations in mankind. $500 for assistant. Work to be continued next year.

George B. Frankforter. The action of aluminum chloride on the carbohydrates in the presence of hydrocarbons. $350 for assistant. Work to be continued next year.

Thomas B. Hartzell. Investigation in dental infection. $200 for materials. Resulted in several papers showing close and hitherto unsuspected relations between mouth infections and rheumatism and lesions of heart and kidneys. Addresses before six State Associations.

Franklin R. McMillan. Shrinkage and time effects on reinforced concrete floors. $500 for assistant. Work to be continued next year.

Wallace Notestein. Editions of notes, D'Ewe's Diary. $200 for materials. Work to be continued next year.

James T. Gerould. Compiling bibliography of seventeenth century English history. $150 for clerical assistance. Manuscript completed and will be published in a new Bibliographical Series of our Research Publications.

James F. McClendon. Physiological research. $60 for materials and apparatus. One paper on reaction of blood published in *Journal of Biological Chemistry.*

Fletcher H. Swift. History of Jewish education. $100 for assistant. Manuscript completed for book on the subject.

J. Frank Corbett. Suprarenal gland. $100 for assistant. Two papers in press, one in the *Northwestern Lancet,* one in the *St. Paul Medical Journal.*

Raymond A. Kent. Tabulation of results of statistics concerning the public school system of Minneapolis. $100 for assistant. Monograph completed and will be published soon. A valuable statistical survey of the largest city school system in the state.

Melvin E. Haggerty. Reports of high school superintendents on the unit-cost of instruction in the Minnesota high schools. $150 for assistant.

Compilation of results on reading tests in Minneapolis high schools. $200 for assistant. These grants, together with aid from public school teachers, brought together 17,000 tests in reading, which have been partially tabulated with the aid of this grant. Work will be continued next year as basis of investigation of psychology of reading.

Teaching staff problems.—I can not close this brief summary without indicating two matters of concern to all interested in graduate work or in any type of advanced teaching.

The increasing appreciation by industrial concerns of the scientifically trained specialist is leading to raids on our teaching staff, notably in the Department of Chemistry, which makes it increasingly difficult to hold our best and most promising research workers. The salaries paid by

private concerns and the laboratories they can equip for the sake of acquiring the monopolistic profits arising out of scientific investigation, are I regret to say, so much better than we can offer for service and discovery for the benefit of the whole community that the outlook is certainly unpromising. The demand is taking now the tens, upon whom the training of the future hundreds and thousands in these fields depends.

The other point is that the funds of certain of our larger colleges such as Science, Literature, and the Arts, are inadequate to take care of the ever increasing throng of undergraduates. Instructors of all grades are overwhelmed by the necessity arising out of this situation and their energies absorbed in routine teaching of inordinately large divisions of elementary work. This leaves them little time and energy for advanced work and individual growth in the fields of their special scholarly interests. Support funds which are too limited to provide enough low salaried instructors, are of course, totally inadequate to the task of keeping good men called by other institutions, increasing the salaries of the best men we retain or calling strong men to give leadership and scholarly tone to all our work, whether graduate or undergraduate. Unless we can look forward in the immediate future to more adequate support funds for instruction we shall, with our great equipment in buildings, give a living proof of the fact that you can not make a university out of bricks and stones.

Respectfully submitted,

GUY STANTON FORD, *Dean*

REPORT OF THE DEAN OF WOMEN

To the President of the University:

SIR: The Dean of Women herewith submits the following report for the year 1915-16:

Registration of Women.—During this year there were registered in the University 1,958 women. The academic distribution is as follows:

Science, Literature, and the Arts	1,094
Education	52
Graduate	50
Agriculture	297
Medicine	7
Dentistry	5
Pharmacy	12
Nurses	94
Engineering	5
Chemistry	4
Total, regular session	1,620
DURING THE SUMMER SESSION, 1915	338
Total	1,958

The distribution as to residence during the regular session of 1915-16 is as follows:

At home	1,057
With friends or relatives	49
In private families	77
In lodging houses	204
In sorority houses	80
In dormitories	91
In Elizabeth Northrop Cottage	11
In Charlotte Winchell Cottage	15
In Home Management Houses	34
In Hospital	2
Total	1,620

Self-government.—The self-government associations have had a year of effective activity. The executive councils have initiated and completed successfully plans for foreign and civic relief work. They have managed with skill and tact difficult cases of conduct, offending seriously against good taste, which have been referred to them. They have promoted a more democratic social spirit and have introduced a finer dignity and moderation into social activities.

The work of the House Council deserves special commendation. Simple but essential rules of conduct have been formulated and administered with unusual energy and success. All of the lodging-houses have been visited by the members of the council and the coöperation of the residents secured. As a result, more rational hours for study, for social engagements, and for the receiving of callers, have been observed.

Sanford Hall.—The superior advantages of living in Sanford Hall are so generally recognized that the number of applications for residence far outrun the accommodations. Ninety-nine women have been refused admission during the year. An additional wing which could be built at a comparatively small expense would take care of more than half of this number. Again its excellent record for health demonstrates the success of the preventive methods used by the resident nurse. There has been developing in Sanford Hall, through the friendly coöperation of the students and the officers, a wholesome social spirit which has no insignificant influence in the liberal training of young women. During the spring the Dean of Women held a series of receptions at the Hall for all University women.

Sororities.—The ruling of the Pan-Hellenic Association that no freshmen shall be initiated who have failed to pass in all the hours of their work has had a stimulating effect on the scholarship of the sororities. The work of freshmen has been closely watched and every effort made to bring it up to at least a passing standard. The effect of excessive social activities on scholarship has been recognized with gratifying results. The sororities have shown a willingness to assist in promoting a more serious attitude toward work, and a more democratic spirit in play.

Lodging houses.—Seventy-six lodging houses have been carefully inspected at least twice a year by the resident nurse. An attempt has been made to improve living conditions by rigorously excluding such houses as fail to conform to the standards necessary for the health and comfort of the residents. In most cases the householders have responded helpfully to the demands of the office, and have also shown a readiness to coöperate with the House Council.

Physical Education.—The report of the Director of Physical Education (pp. 145-147) reviews the progress of the year which the new gymnasium has greatly stimulated. Unusual conditions prevail in the staff, in the equipment, and in the close coöperation with this office for the safeguarding and the improvement of the health of University women. The enthusiasm for out-of-door sport and physical exercise bears eloquent testimony to the admirable work of this department.

Loans and scholarships.—The Woman's Loan Fund, established mainly through the efforts of Mrs. George E. Vincent, has proved a boon to the needy student. During the year $635 have been lent in sums ranging from $10 to $100. Beneficiaries of the fund are repaying loans promptly. During the year the Women's Self-Government Association has contributed $50 to the fund. The St. Paul College Woman's Club granted two more scholarships for the year 1916-17 of $100 and $50 respectively. This makes a total grant from the Club of $250 for the coming year.

The Dean of Women wishes to emphasize the statement made in her last report that the demands made by academic, administrative, and social duties are too varied and complex to be carried successfully by the present office staff. Two hundred fifty-six additional women students in 1915-16 have seriously aggravated the need for more assistance.

Respectfully submitted,

MARGARET SWEENEY, *Dean*

UNIVERSITY EXTENSION

AGRICULTURAL EXTENSION DIVISION

During the year ending July 31, 1916, the Agricultural Extension Division had in its employ sixteen men and four women for full time. Five men and two women were employed for part time during the winter season, and from seventeen to twenty-one county agents were employed, besides seventeen Farmers' Institute workers, who were employed by the week through the winter, and the regular office force.

Sources of revenue.—The following sources of revenue were available for the year 1915-16:

State appropriations for extension work in Agriculture and Home Education, to be expended only for agricultural extension work under the supervision of the Board of Regents of the University of Minnesota..		$30,000.00
State appropriations for Farmers' Institutes		23,000.00
State appropriations for county agents to be expended under the supervision of the Dean of the Department of Agriculture in sums not to exceed $1,000 per county in any one year and only to counties that have raised a like amount		15,000.00
Appropriations by county commissioners for county agent work and local funds subscribed to support county agent work		23,644.27
Federal Smith-Lever funds to be expended under projects submitted by the Director of Agricultural Extension and approved by the States Relations Service of the U. S. Department of Agriculture		24,899.00
Federal funds appropriated to the U. S. Department of Agriculture and used for coöperative extension work in Minnesota under the following projects:		
County Agents and County Agent Leader	$9,360.00	
Boys' and Girls' Club Work	2,400.00	
Farm Management Demonstrations	2,500.00	
Cow Testing Associations	1,900.00	
		16,160.00
Total		$132,703.27

Offices and equipment.—The Agricultural Extension Service has been furnished offices in the Administration Building of the College of Agriculture, University of Minnesota, with light and heat free. The office equipment has been purchased with funds appropriated by the State for extension work and consists of the needed desks, chairs, filing cases, bookcases, typewriters, adding machines, and a motor-driven self-feed multigraph, stationery, etc.

Fifteen sets of lantern slides have been made up by the Division and are used by field workers, also loaned to county agents, high-school agriculturists, and others for use in the state. Three stereopticons are owned by the Division and used wherever needed. All county agents and most agricultural high schools have stereopticons. The Division owns two motion picture films and rents others as occasion demands. These are used at Short Courses, at the State Fair, and at other gatherings where

machines and proper light can be secured. The Division has full equipment for chart-making and all field workers are supplied with charts as needed. Models of buildings and farm equipment are used, also materials for various demonstrations such as cooking, canning, pruning, etc.

PUBLICATIONS

Popular Extension bulletins are published from time to time, usually ten or twelve a year. The bulletins contain from 4 to 24 pages, usually 8 or 16 pages. At present 75,000 copies are published. There are over 55,000 names on the mailing list receiving these bulletins as issued. Large numbers are sent out on special request.

Special Extension bulletins are published as need arises. There is no mailing list for these bulletins. They are got out for special audiences and to answer inquiries. The size of these bulletins and the size of the edition is varied with the requirements. Five bulletins were published in this series during the fiscal year.

University Farm Press News, a one-page five-column news sheet, is published semi-monthly and sent to all papers published in the state. This news sheet is made up of notes and short articles of timely interest.

Farmers' Institute Annual No. 28 was published. This is a book of 320 pages, bulletin size. Fifty thousand copies were issued. These are distributed at Farmers' Institutes and other farmers' meetings throughout the state. This issue was devoted to types and breeds of farm animals. All of the common breeds were described and cuts of male and female of each breed included.

Farmers' Library.—The following numbers have appeared:

No. 57. *More and Better Acres of Corn for Minnesota,* by A. C. Arny, Division of Agronomy and Farm Management. 12 pages. 75,000 copies issued.

No. 58. *Lighting Farm Buildings,* by J. L. Mowry, Division of Agricultural Engineering. 8 pages. 75,000 copies issued.

No. 59. *Cost of Producing Field Crops,* 1908-12, by F. W. Peck, Division of Agronomy and Farm Management. 8 pages. 75,000 copies issued.

No. 60. *House Heating,* by J. L. Mowry, Division of Agricultural Engineering. 16 pages. 75,000 copies issued.

Reprints.—No. 24, *Seed Testing,* by W. L. Oswald; No. 49, *Alfalfa Growing in Minnesota,* by A. C. Arny; and No. 50, *Seed Potato Plot,* by E. C. Stakman and Richard Wellington, were reprinted in editions of 25,000.

Special Series bulletins were published as follows:

No. 3. *Bread-Making Contest,* by members of the Extension Division. 12 pages. 10,000 edition.

No. 4. *Woodworking Exercises for the Agricultural School Shop,* by H. B. White, Division of Agricultural Engineering. (Reprint of Experiment Station Bulletin No. 135). 34 pages. 10,000 edition.

No. 5. *Standard Potato Varieties for Minnesota,* by Richard Wellington, Division of Horticulture, and C. E. Brown. 8 pages. 15,000 edition.

No. 6. *Outline for Club Work,* by Misses Rowe, Shepperd, and Bull, Agricultural Extension Division. 8 pages. 10,000 edition.

No. 7. *Quack Grass Eradication,* by A. C. Arny, Division of Agronomy and Farm Management. (Popular edition of Experiment Station Bulletin No. 151.) 16 pages. 10,000 edition.

University Farm Press News.—Twenty-four issues of *University Farm Press News* are published. 3,500 copies each issue.

PROJECTS

FARMERS' INSTITUTES

Farmers' Institute work has been handled through the same organization as the Agricultural Extension work. It is supported, however, by a separate fund and administered by a separate board. In reality it is but a branch of the Agricultural Extension work. Most of the Institute workers are practical farmers and home-makers, who are employed in their homes or on their farms during the greater part of the season. During the year 75 regular Institutes—202 sessions—were held with a total attendance of 31,421; and 453 special meetings, largely farmers' club meetings, were held with a total attendance of 39,591. In addition to these meetings the Farmers' Institutes contributed considerably toward the cow-testing association work, toward the maintenance of farmers' clubs, organization of livestock shipping associations, judging at county fairs, and alfalfa and soil demonstrations. Institute workers were used to the extent of about $1,100 in the Short Course work.

SHORT COURSES

Twenty-eight regular five-day Extension Short Courses were held in as many towns:

Fosston	Jordan	Tracy
Slayton	Villard	New Richland
St. Peter	Hawley	Bricelyn
Montgomery	LaPorte	Kasson
Farmington	Sherburn	Morristown
Silver Lake	Luverne	New York Mills
Ogilvie	Bingham Lake	Warren
Brainerd	Spring Valley	Medford
Alden	Buffalo	
Mountain Lake	Dayton	

Owing to a shortage of funds the cars of stock and equipment used last year were dispensed with. Each corps, however, was equipped with demonstration material, and local livestock was used for judging demonstrations. Livestock, farm management and farm buildings were especially emphasized in the men's work, and health, sanitation, and foods and nutrition in the women's work. A total of 5,990 persons attended the Short Courses, of which 2,490 were women and 3,500 men.

COUNTY AGENTS

On June 30, 1916, there were seventeen counties employing county agents. Seven counties—Carlton, Douglas, Kandiyohi, Koochiching, Norman, Polk, and Redwood—discontinued, and Steele County began, the work. Difficulty has been experienced in maintaining the work in several of the counties where it was not properly started. We believe that now we have most of the remaining counties so organized that the work will continue effectually, as practically all of them have fairly strong organizations backing them in the work. It is hoped that a bill may be passed by the next Legislature enabling the counties to raise by taxation at least $2,000 annually instead of $1,000 to support the work. Thirty-five hundred dollars to $5,000 per county is needed properly to maintain the work and raising money by popular subscription is hardly desirable.

Marked improvement has been made in the character of the county agent work. This has been largely due to the further application of the scheme of agreeing on definite plans of work for the year, which have primarily followed projects previously initiated in each of the counties, and improvements or organization to support and direct the movement.

The tendency of counties to discontinue coöperation, it is believed, has run its course. This situation is an evident reaction of the unfortunate manner in which the work was started in some of the counties, which consisted of a lack of proper preparation of counties for the work. On July 1, 1916, eleven of the twenty-nine counties taking up the movement, had discontinued coöperation. The discontinuance in one more county is likely. Indications are that in the other seventeen counties the work will continue permanently. Agitation has progressed to initiate the work in several counties, including some of the counties where the work was discontinued, but little encouragement has been given to these for the present, for it was felt better to give primary attention to counties where the work is in progress that their example may furnish the better demonstration of the merits of the movement. Granting that some mistakes were made, as these were quite natural to occur in organizing a movement without much precedence, yet it can not be denied that in every county the work has justified itself. The effects of the work are apparent even in counties which discontinued coöperation.

Reduction of Federal aid available under the Smith-Lever Act, following the reduction of aid for Agricultural Extension by the Legisla-

ture of 1915, has been a handicap to the movement in nearly all the counties.

Notwithstanding the difficulties, there is much satisfaction to note the progress of the work, the accumulation of results, and the increase of the good moral and financial support of the people, particularly the farmers, of the counties where the work is in progress.

Improved methods applied.—As previously indicated, definite yearly plans of work have been crystallized and followed in each county. Usually not more than four or five projects having to do with outstanding agricultural problems of each county have been chosen. Many of these projects were put in written form and signed by representatives of cooperating parties. An improved plan of farm-bureau organization has been developed by which the active support and assistance of all interested rural organizations are afforded the opportunity to coördinate their activities. Such plan of organization or reorganization has been adopted during the year in Wilkin, Hennepin, Jackson, Lac qui Parle, Pope, Grant, and Steele counties. More attention during the year has been given to the dissemination of information regarding the work. The publication of the *Minnesota Farm Bureau News,* a four-page monthly circular, was initiated in August, 1915. This is sent to county agents, county commissioners, officers, and local committeemen of Farm Bureau Associations and similar organizations. The publication of *County Farm Bureau News,* of similar make-up, for the counties, has been instituted in Grant, Hennepin, Jackson, Ramsey, and Renville counties. Other counties contemplate issuing such publications.

Results of the work.—As the organization of the work of the county agents quite naturally follows the calendar year, a brief of the results for a year ending July 1 is not as complete as would be a statement for the calendar year. The outstanding results of the work of 1915 are as follows:

Approximately 3,500 acres of alfalfa were planted in 1915 in supervised demonstrations.

Thirteen hundred soil acidity tests were made in thirteen counties in coöperation with the Soils Division in the fall of 1915 and spring of 1916, as a basis of liming and alfalfa culture demonstrations conducted in 1916.

A remarkable increase of attention to livestock production has been effected. During 1915, on the suggestions of the county agents, livestock was secured by farmers as follows: registered animals—stallions, 10, bulls, 200, cows, 193, rams, 19, ewes, 38, boars, 240, and sows, 166; registered sires transferred from one community to another, 96; animals other than pure-bred purchased—dairy cows, 643, beef cows, 260. During 1915, six cow-testing associations, with 1,760 cows under test, were organized and six livestock breeders' associations were formed with 171 members.

There was a great reduction in the prevalence of hog cholera, as

during 1914 approximately 186,000 hogs were vaccinated in county agent counties, and in 1915 there were only 12,000 head treated. While much of the decline may have been natural, yet it is certain that depots of serum constantly maintained, with arrangements made for immediate vaccination, and the general educational campaigns as to control conducted, contributed materially to the saving of thousands of dollars' worth of hogs.

FARM MANAGEMENT DEMONSTRATIONS

The object of this work is two-fold; first, to secure figures showing the financial results of the year's business from 50 to 75 farms in a county, with a view to using these figures to demonstrate some of the essentials in profitable farming to the farmers of the county; second, to acquaint interested farmers with a simple and convenient method of farm accounts.

During the year ending July 31, 1916, demonstrations have been continued in the following counties: Clay, Washington, Dakota, Jackson, Renville, Pope, and Kandiyohi. New demonstrations have been inaugurated in Otter Tail, Crow Wing, Lac qui Parle, and Traverse counties.

The total number of coöperating farmers has been approximately the following: (The demonstration in Stevens County was discontinued.)

COUNTY	NUMBER OF COÖPERATORS
Clay	52
Washington	48
Dakota	20
Jackson	59
Renville	55
Pope	62
Kandiyohi	18
Otter Tail	73
Crow Wing	42
Lac qui Parle	54
Traverse	57
Total (11 counties)	540

These demonstrations were all carried on in coöperation with the county agricultural agents of the respective counties.

During the year, 35 articles were written for local papers, describing the results secured. These articles are known to have been used by the papers 175 times, counting each appearance of each article in one paper as one time.

WORK WITH HIGH-SCHOOL AGRICULTURISTS

Twenty-four different high-school agriculturists were furnished with a total of 304 account books for the use of farmers in their localities

The understanding in each case was that the high-school agriculturist would place each book with an interested farmer and act as local supervisor of the work.

DAIRY EXTENSION WORK

One man was employed in Dairy Extension work for half time. Owing to a reduction in funds it was necessary to allow this man, Mr. A. J. McGuire, to devote half of his time to teaching in the School of Agriculture, so he could be paid from other funds. This left only six months for extension work. During that time, he spent his time in encouraging the undertaking of better care of livestock, better care in feeding, and better creamery management. He attended farmers' clubs and creamery association meetings, and spent considerable time working in a few localities where special help was needed to strengthen the local creamery.

Another man who had formerly devoted full time to extension work in livestock was employed in coöperation with the U. S. Department of Agriculture to devote his time entirely to cow-testing work and breeders' association work. During the year twelve new cow-testing associations were organized and the other associations somewhat strengthened. This makes 22 associations now in the state with a total membership of 689 farmers and with 8,100 cows under test. Several new livestock breeders' associations have been organized, so that there are now 24 of these local breeders' associations. This man made several trips both outside and in the state with livestock men desiring to purchase purebred and grade stock.

DEMONSTRATION FARMS

Twenty-four demonstration farms were operated under the supervision of the Division. Early in the year, one of the men employed to supervise the work left with a year's leave of absence. This left the work to be taken care of by two men. Hence, it was necessary to drop a few of the farms. These farms are owned by farmers who operate them for profit. No money is paid to the farms from outside funds. The Division simply expends the cost of supervision. Considerable progress was made in the improvement of the livestock on these farms, especially along dairy lines. Altho the year was unfavorable for corn, nearly all of the farms were able to make a small profit. Some of these did remarkably well under the circumstances.

COMPARISON OF DAIRY PRODUCTION

AVERAGE PER COW

FARM	POUNDS OF MILK		POUNDS OF FAT	
	1915	1916	1915	1916
Thief River Falls	5,739.5	5,332.9	279.67	248.70
Albert Lea	6,129.8	6,126.5	341.39	328.67
Carver	5,331.55	5,488.5	226.02	233.72
Wadena	7,372.5	6,146.0	246.90	215.00
Hutchinson	7,670.4	6,504.2	306.95	272.89
Lakefield	6,034.7	7,404.7	258.41	323.79
Fairmont	6,193.6	5,562.8	233.86	215.04
Dawson	5,004.2	6,217.6	198.64	232.23
Fergus Falls	5,120.1	7,060.4	206.30	296.10
Little Falls	5,159.8	5,094.2	189.14	191.86
Park Rapids	4,089.6	4,255.4	168.24	172.63
Brainerd	5,297.8	5,731.0	210.30	223.04
Brook Park	5,365.6	5,205.3	188.96	200.99
Pipestone*	5,241.1	.....	188.35	.....
Lewiston*	6,621.1	.....	271.30	.....
Long Prairie†	5,034.0	.....	209.59	.....
Osakis†	4,580.5	.....	193.50	.....
Mapleton†	.....	5,956.1	.....	269.80
Bagley‡	.....	4,726.7	.....	193.01
Total	95,985.85	86,812.3	3,917.52	3,617.47
Dem. Farms' Aver. per Cow	5,646.2	5,787.5	230.44	241.16
State's Average per Cow	4,500.00	4,500.0	160.00	160.00
Difference	1,146.20	1,287.5	70.44	81.16

* Discontinued in 1916.

† Incomplete in 1916—Mapleton incomplete in 1915.

‡ New farm taken on in 1916.

NOTE: When comparing the milk production of the Demonstration Farms with state averages it must be remembered that many of the Demonstration herds are beef cattle not kept for dairy purposes. This lowers the total average of the special dairy herds.

HOME ECONOMICS

During the year, three women were employed regularly for Home Economics work and two women were employed part time. During September and October, the greater part of the time of the women was devoted to doing judging and demonstration work at the state and county fairs. During November and December most of their time was devoted to making farmers' club meetings and other special meetings. During January, February, and March, three of the women were employed constantly in the Short Course work and two in making Farmers' Institute meetings. In addition to the regular workers, seniors in the College of

Agriculture specializing in Home Economics work were sent out as assistants to the regular Short Course workers. The assistants spent a week in each place and received for the work only their expenses and credit in the College of Agriculture. An attempt was made at each Short Course to leave in the community some definite organization of women that would continue the study of the work started at the Short Course. A number of these organizations were started. During the time from April 1 up to June 30 the three women regularly employed devoted their time mostly to farmers' club meetings and to attending meetings of the women's organizations in the towns in which Short Courses were held. The local organization of women and the follow-up work after the Short Courses did not work out as satisfactorily as it was hoped.

SPECIAL MEETINGS

During the year the Extension Division, including the Farmers' Institutes, were called upon to take care of 1,365 special meetings, such as farmers' club meetings, teachers' and school officers' meetings, meetings of farmers' coöperative organizations, etc. The total attendance at these meetings was 143,034.

FARMERS' CLUBS

One man was employed for a large part of the year with Farmers' Institute funds to assist with the farmers' club work. There were, on June 30, 1916, about 1,100 of these clubs in the state. Each club, according to our reports, has an average membership of 23 families or approximately 100 people. We consider the farmers' club one of the strongest forces in the state for agricultural development. A *News Letter* has been multigraphed monthly and sent to all of the clubs. This letter merely reports the activities of the clubs that report to the Division. One of the farm papers in the state has devoted throughout the year a full page to the farmers' club work. This page has been devoted chiefly to reports from local clubs. The clubs have taken up and studied many phases of farming and farm home-making. They have had socials and picnics, have encouraged boys' and girls' clubs, have held fairs, many of them have club yells, club songs, colors, and banners. They have provided their schools with equipment for serving hot lunches to the pupils. They have secured traveling libraries. They have put on plays, entertainments, and pageants. They have been instrumental in securing Farmers' Institutes and Short Courses, and have assisted in bringing about the consolidation of schools. In a business way the clubs have organized cooperative creameries, elevators, livestock shipping associations, breeders' and crop producers' associations, also associations for the sale of other products by the carload and for the purchase of supplies in the same way. One club assisted in the organization of a coöperative laundry in connection with a coöperative creamery. In fact, we look upon the club movement as the logical forerunner of coöperative effort among farmers.

COÖPERATIVE ORGANIZATIONS

Growing out of the activities of the farmers' clubs the Division has been asked to help in the organization of a few coöperative creameries, a few coöperative elevators, and several coöperative livestock shipping associations. During the year at least 100, and probably more than 100, shipping associations have been organized. On June 30, 1916, there were about 300 of these associations in active operation. These associations handle about 25 per cent of the livestock shipped in the state.

BOYS' AND GIRLS' CLUB WORK

The Boys' and Girls' Club Work has continued successfully. Twenty-three hundred boys, representing 184 clubs, have taken part in the corn-contest work; 680 boys, representing 96 clubs, in the pig-contest work; 2,536 girls, representing 200 clubs, have taken part in the garden and canning work; 3,500 girls, representing 210 clubs, in the bread-making contest; and 1,260 boys and girls, representing 105 clubs, in the potato contest.

RURAL PLAYS

Two plays, *Back to the Farm* and *Kindling the Hearth Fire*, have been published by the Division. Under the direction of a dramatic teacher at the Agricultural College casts of students were trained and were allowed credit for going out to different places in the state and putting on these plays. This was done only in communities where the entire cost of putting on the plays was guaranteed. *Back to the Farm* was given in seven places, and *Kindling the Hearth Fire* in ten places. These plays were most entertaining and very well received.

POULTRY EXTENSION WORK

One man was employed throughout the season on Poultry Extension work. His work was conducted in connection with the county fairs, farmers' clubs, Short Course, poultry shows, and in one poultry demonstration community where a great deal of work has been done in standardizing the breeds of poultry, in building and equipping suitable poultry houses, and in working out a coöperative system of marketing eggs. Marked progress has been made in the poultry industry of this community and it is hoped to extend this work to other communities in the state.

POTATO DISEASE CONTROL

In coöperation with county agents and high-school men, the potato specialists of the Division conducted numerous demonstrations in the selection of disease-free seed and in the control of disease in the growing plots. Quite marked results were secured in this line and several communities were started in the development of disease-free strains of potatoes. Since Minnesota has a large market for seed potatoes the control

of potato diseases is very important, and it is hoped to continue and to develop this work further, and to carry it far enough to help the people who produce disease-free potatoes or pure stock to sell them to advantage. Some plan of potato certification must be worked out by which the growers of desirable stocks of potatoes may receive a certificate that will enable them to market these potatoes to advantage.

ALFALFA DEMONSTRATIONS

During the fall of 1914 a survey of 226 fields of alfalfa on as many different farms in Southeastern Minnesota was made and the number of failures was found to be about three out of four. Soils were tested for acidity and the plants were examined for inoculation. It was evident from this work that the reasons for failure were, first, that a large percentage of soils in that section of the state is acid and that a large part of the alfalfa planted was never inoculated, either artificially or otherwise. In 1915, coöperative demonstrations were started on 168 farms in that section of the state. Lime was applied where needed and artificial inoculation was used, with the result that out of the 168 fields only six failed to make a stand. The average stand on the fields was 94 per cent; 80 per cent of the plants was inoculated. In the following fall, acid and alfalfa surveys were conducted in twelve different counties and showed that very little acid exists on the heavier soils outside of southeastern Minnesota. In the spring of 1916, 156 fields on as many farms in widely scattered sections of Minnesota were sown as demonstration plots. Lime was applied where needed and all plots were inoculated. It is hoped to continue the work until the best method of growing alfalfa in each section of Minnesota shall have been fully demonstrated.

Respectfully submitted,

A. D. WILSON, *Director*

GENERAL EXTENSION DIVISION

The General Extension Division covers as its field evening extension classes in the Twin Cities, Duluth, and elsewhere; correspondence courses; extension lectures and University Lyceum; a Municipal Reference Bureau; a lantern slide bureau; and short courses for merchants. University Weeks are conducted each year in selected towns of the state, and debating in the high schools is fostered. Advice is also given to those interested in the organization of community centers in schools and other public buildings. Similar advice and encouragement is given to the commercial bodies of the towns. Because of the reduction in the legislative appropriation the work of this Division has had to be somewhat curtailed during the year under review. For this reason the report will show a slight falling off in the registration for the evening extension classes. Details of other branches of extension activity will be found elsewhere in this report.

EVENING EXTENSION CLASSES

The first semester began September 27, 1915, and ended January 29, 1916. The second semester began January 31, 1916, and ended May 20, 1916.

COLLEGIATE COURSES

CLASS	ENROLLMENT FIRST SEMESTER	ENROLLMENT SECOND SEMESTER
MINNEAPOLIS		
British Poetry	25	...
Chemistry	23	...
Economic Democracy	18	...
Educational Diagnosis	215	...
Educational Psychology	25	...
English Novel	...	27
French, Beginning	18	6
French, Second Year	9	7
French, Lectures	13	16
Geology and Geography of Minnesota	...	12
German, Beginning	15	9
German, Elementary Conversation	17	11
German, Advanced Conversation	19	15
German Prose and Poetry	17	7
History of Education	15	...
Immigration	...	16*
Man and His Living	105‡	20
Present Day Philosophy	15	...
Public Speaking	42	20
Rhetoric	26	16
Shakespeare	43	...
Short Story	21	...
Spanish	23	7
Story Telling	...	48*
Swimming	82†	98§
Wonderlands of America	79†	...
Total	846	246

* Two sections. † Three sections. ‡ Four sections

§ In addition to first semester.

Class	Enrollment First Semester	Enrollment Second Semester
ST. PAUL		
(IN COÖPERATION WITH THE ST. PAUL INSTITUTE)		
English Novel	...	27
French Conversation	18	10
Geology and Geography of Minnesota	...	16
German, Elementary Conversation	12	12
Greek Mythology	...	20
Public Speaking	25	15
Shakespeare	29	...
Wonderlands of America	22	...
Total	106	100
ST. PAUL		
(CONVENT—SISTERS OF VISITATION)		
Rhetoric	12	12
Total	118	112
DULUTH		
Regional Geography	59*	...
Geology and Geography of Minnesota	...	20
* Two sections.		
ST. CLOUD		
Immigration	...	19
TOTAL COLLEGIATE		
Minneapolis	846	246
St. Paul	118	112
Duluth	59	20
St. Cloud	...	19
Total	1,023	397

BUSINESS COURSES

MINNEAPOLIS		
Accounting, Introduction	40*	21
Accounting, Principles A	30*	...
Accounting, Principles B	...	15
Accounting, Practice A	34	...
Accounting, Practice B	...	26
Accounting, Applied A	9	...
Accounting, Applied B	...	7
Advertising	23	22
Banking Practice	41	...
Business English	43	11
Business Law A	78*	15
Business Law B	...	38
Business Law C	23	...
Business Law D	...	27
Business Law for Bank Clerks	45	27
Corporation Finance	...	34
Elements of Economics	34	...
Economics for Bankers	...	22
Railroad Traffic and Rates	21	16
Retail Merchandising	7	...
Salesmanship	24	14
Total	454	321

* Two sections.

Class	Enrollment First Semester	Enrollment Second Semester
St. Paul		
(in coöperation with the St. Paul Institute)		
Accounting, Principles A	22	...
Accounting, Principles B	...	15
Accounting, Practice A	23	...
Accounting, Practice B	...	14
Advertising	12	...
Business English	24	...
Business Law A	39	...
Business Law B	...	24
Elements of Economics	11	...
Economics for Bankers	...	8
Salesmanship	18	...
Total	149	61
Duluth		
Accounting, Principles A	28	...
Accounting, Principles B	...	13
Accounting, Practice A	14	...
Accounting, Practice B	...	11
Total	42	24
Austin		
Business Law A	...	13
Owatonna		
Business Law A	13	...
Total Business		
Minneapolis	454	321
St. Paul	149	61
Duluth	42	24
Austin	...	13
Owatonna	13	...
Total	658	419

ENGINEERING COURSES

Class	Enrollment First Semester	Enrollment Second Semester
Minneapolis		
Applied Mechanics	21	...
Architectural Design, Elementary	22	10
Architectural Design, Intermediate	6	4
Architectural Design, Advanced	15	7
Electricity, Beginning	15	8
Lettering and Sketching	10	...
Lumber and Its Uses	...	27
Mechanical Drawing	23	19
Reinforced Concrete Design	12	...
Shop Mathematics	28	17
Strength of Materials	...	17
Structural Design	3	...
Testing Materials	17	8
Trigonometry	22	11
Total	194	128

CLASS	ENROLLMENT FIRST SEMESTER	ENROLLMENT SECOND SEMESTER
ST. PAUL		
(IN COÖPERATION WITH THE ST. PAUL INSTITUTE)		
Shop Mathematics	8	5
DULUTH		
Electricity	3	...
Strength of Materials	7	3
Total	10	3
TOTAL ENGINEERING		
Minneapolis	194	128
St. Paul	8	5
Duluth	10	3
Total	212	136

SUMMARY OF ENROLLMENT

	FIRST SEMESTER	SECOND SEMESTER	TOTAL FOR YEAR
COLLEGIATE COURSES			
Minneapolis	846	246	1,092
St. Paul	118	112	230
Duluth	59	20	79
St. Cloud	.....	19	19
	1,023	397	1,420
BUSINESS COURSES			
Minneapolis	454	321	775
St. Paul	149	61	210
Duluth	42	24	66
Austin	.....	13	13
Owatonna	13	...	13
	656	419	1,075
ENGINEERING COURSES			
Minneapolis	194	128	322
St. Paul	8	5	13
Duluth	10	3	13
	212	136	348
Total	1,891	952	2,843

The tuition fees paid by students for night classes in the first semester amounted to $9,873.50 and in the second semester to $5,821.75, a total of $15,545.25.

Two thousand eight hundred forty-three was the total number of registrations for night classes during the year 1915-16. These registrations were made by 1,951 individuals.

According to an arrangement made with the St. Paul Institute, ten per cent of the gross fees obtained from students in St. Paul classes was paid to the St. Paul Institute. This amounted to $144.55 for the first semester and $91 for the second semester, a total of $235.55.

All extension night classes are semester classes and the registration is therefore taken twice in the academic year.

COMPARISON OF ENROLLMENT FOR 1914-15 WITH 1915-16

TOTAL COLLEGIATE		
Minneapolis	861	1,092
St. Paul	218	230
Duluth	10	79
St. Cloud	46	19
Winona	20	.....
	1,155	1,420
TOTAL BUSINESS		
Minneapolis	1,031	775
St. Paul	426	210
Duluth	195	66
Austin	32	13
Albert Lea	91	.....
Northfield	25	.....
Owatonna	.....	13
St. Cloud	46	.....
	1,846	1,075
TOTAL ENGINEERING		
Minneapolis	312	322
St. Paul	16	13
Duluth	21	13
	349	348
Total	3,350	2,843

MERCHANTS' SHORT COURSE

The third annual Merchants' Short Course was held in the Main Engineering Building during the week of January 24-29, 1916. The attendance fell off this year, the registration being slightly under one hundred. An attempt was made to ascertain the cause of this falling off. Various reasons were suggested, the main one being that the course was held two weeks earlier than usual. It has been decided to conduct this course in the future in February rather than in January.

To the one week course was added a three weeks' course running from January 31 to February 19, 1916. The three weeks' course was conducted more in the nature of a school than a convention consisting of detached lectures. Each subject was presented in class recitation three times per week and besides the general and fundamental topics there were special sessions for the hardware group, for the dry goods group, and for those interested in groceries.

Thirty-six were registered for the three weeks' course and the interest of the students appeared keen throughout the term. The following subjects were presented, necessarily in a brief manner, during the three weeks' course: Merchandise Display, Showcard Writing, Store Administration, Business Law, Retail Accounting, Advertising, Salesmanship, Textiles. Special lectures were given on the various phases of the hardware business, shoes and rubbers, food and groceries, cotton goods, ladies' ready-to-wear garments.

One feature of the course was the conference held in three or four large retail stores of the Twin Cities after closing hours, the conferences being led by some member of the business firm, who took up such subjects as Display and Buying of Merchandise. Another feature was the visitation of some of the more important manufacturing establishments in the Twin Cities by groups of students.

The results of the experiment of conducting a longer course than the one week course given in the past were very gratifying and demonstrated the genuine demand for this form of instruction. Very little attention was given to publicity in regard to this course.

UNIVERSITY WEEKS

The fifth annual tour of University Weeks occurred May 29 to June 10, 1916, inclusive. The fee charged each town was $400 and twelve towns entertained the Week. The towns visited during the week May 29 to June 3, together with the managers were as follows: New Ulm, A. E. Koenig; Sleepy Eye, J. S. Mikesh; Minneota, H. B. Gislason; St. Charles, C. L. Rotzel; Zumbrota, E. L. Bennett; West Concord, O. C. Edwards.

The towns visited during the week of June 5 to June 10 together with the managers were as follows: Ada, A. E. Koenig; Fertile, R. J. McFall; McIntosh, O. C. Edwards; Twin Valley, E. M. Lehnerts; Hawley, C. L. Rotzel; Halstad, G. Dietrichson.

The following members of the faculty took part in the Weeks as participants in the program: James Davies, A. S. Edwards, H. A. Erickson, H. J. Fletcher, George G. Glick; Francis Jager, A. E. Jenks, E. M. Lehnerts, B. L. Newkirk, S. F. Pattison, Willis J. Plummer, C. H. Preston, Bess Rowe, Charles Skinner, Richard R. Price.

In addition to the members of the faculty who participated in the programs there were thirty-two students and sixteen people from outside the University who assisted. The financial report follows:

EXPENDITURES

Fees to participants	$1,445.00
Traveling expenses of participants, including managers	2,353.61
Expenses of Mr. Oshier booking the Weeks	115.33
Hotel, bus, drayage, automobile	1,433.16
Advertising	156.85
Printing	239.52
Postage	79.00
Incidentals, including royalty for play, fee for coaching play, rental of costumes, etc.	324.35
Express	13.02
Extra office help	13.60
Total	$6,173.44

RECEIPTS

Total receipts from the twelve towns	$4,800.00
Amount contributed by the University from Extension funds	1,373.44
Total	$6,173.44

CORRESPONDENCE COURSES

Number of students enrolled from August 1, 1914, to August 1, 1915	102
Number of students enrolled from August 1, 1915, to August 1, 1916	199

This increase for 1915-16 amounts to 95 per cent. These 199 students registered in 251 courses:

Number of expirations not reinstated		24
Number of courses cancelled and refunded during year		29
Number of reinstatements of registrations during year		37
Number of courses completed during year		86
Number of courses carried during the year		
In Business subjects	102	
In Collegiate subjects	207	309
Number of active students during year (those sending in four or more lessons)		182
Number of inactive students whose terms have not expired		59
Number of students carrying two courses during year		80
Number of instructors carrying on courses		35
Number of students on roll August 1, 1916		196
Number of students active on August 1, 1916		96

LECTURE AND LYCEUM DEPARTMENT

The Lecture and Lyceum department showed a gratifying development during the year.

56 attractions were used altogether
15 were members of the University faculty
1 was the University Glee Club
40 were taken from outside the University.

One hundred ten towns were given courses of two or more numbers. On these courses 541 attractions appeared and the fees collected amounted to $29,145.

Forty-two towns had single lectures or entertainments and the total amount of fees collected was $1,665.

In addition to the courses listed above the General Extension Division arranged for two series of addresses given before the Town Criers Club of St. Paul in connection with their regular noon-day luncheon.

A series of lectures was delivered by Dr. R. V. Phelan of the Division before the Searchlight Club of Minneapolis for which the fee of $75 was received.

A series of three talks was also given for the Carpenters' Union of Minneapolis for which no fees were charged.

COMPARISON BETWEEN THE YEAR 1914-15 AND THE YEAR 1915-16

COURSES

	1914-15	1915-16
Number of towns having courses	100	110
Number of engagements filled	522	541
Price of courses	$25,040.83	$29,145.00

Increase in number of towns having courses, 10 per cent.

SINGLE LECTURES OR ENTERTAINMENTS

	1914-15	1915-16
Number of towns having lectures or entertainments	89	42
Number of engagements filled	94	59
Amount of fees	$2,784.49	$1,785.00

Up to July 31, 1916, courses of from two to ten numbers were booked in 130 towns for delivery during the season of 1916-17. The total cost of these courses aggregates $35,000.

COMMENCEMENT ADDRESSES

In addition to the lectures and entertainments listed above, 40 engagements for commencement addresses were booked through this office. Twenty different men were used in filling these engagements.

LANTERN SLIDES

During the year the following sets of lantern slides were sent to 80 towns. The total number of sets used was 205. In the preceding year, 52 towns made use of 106 sets.

Birds of Minnesota
Caesar's Helvetian Campaign
Conquest of Tuberculosis
Following Great Men through Greece
India
Insect Pests
Passion Play at Ober-Ammergau
Philippine Islands
Private Life of the Romans
Roman Architecture and Sculpture
Rome, the World Center of Olden Times
Switzerland
Wild Flowers of Minnesota

EXTENSION DEBATES

In connection with University Weeks debates were given by University students under the direction of the Division in twelve towns. In addition to this, debates were given at two towns. Objection on the part of the faculty because of the amount of time taken from University work caused the number of these debates to be limited.

MUNICIPAL REFERENCE BUREAU

During the year 1914-15, 80 villages and cities availed themselves of the services of this Bureau. During the year 1915-16, 100 villages and cities referred specific inquiries to this department. Most of these inquiries came from officials but among them were inquiries from commercial and civic organizations, from newspaper editors, and from private

citizens. The total number of inquiries received was somewhat over two hundred and touch upon various aspects of some 75 subjects. In addition to these inquiries from within the state the Bureau has received and answered a large number of inquiries from without the state.

The Bureau gathered information by questionnaires sent to the municipalities of the state upon a large number of subjects, among them street oiling, septic tanks, central station heating, and commercial and civic organizations. An inquiry was also sent to all the railroads of the state asking information relating to the purchase of water from municipal and private plants. A new bi-monthly magazine, *Minnesota Municipalities,* was established in February, 1916. This magazine is devoted to the record of municipal progress in Minnesota and is circulated among the membership officials of the League of Minnesota Municipalities.

Respectfully submitted,

RICHARD R. PRICE, *Director*

THE SUMMER SESSION

To the President of the University:

SIR: I beg leave to submit a final report on the Summer Session which was held from June 12 to July 21, 1916.

Enrollment.—Men registered, 419; women registered, 648; total, 1,067. Minnesota residents, 925; non-residents: Alaska, 1, Arizona, 1, Canada, 2, China, 2, Colorado, 2, Idaho, 4, Illinois, 8, Indiana, 3, Iowa, 21, Kansas, 4, Kentucky, 1, Michigan, 4, Missouri, 6, Montana, 7, Nebraska, 3, New York, 1, North Dakota, 13, Norway, 1, Ohio, 1, Oklahoma, 1, Oregon, 1, Pennsylvania, 1, South Dakota, 11, Texas, 1, Washington, D. C., 1, Washington, 1, Wisconsin, 40.

Students registered for one course	357
Students registered for two courses	400
Students registered for three courses	224
Students registered for four courses	86
Total	1,067

The total number of students enrolled in 1915 was 869. The total increase for 1916 was 198. This, however, does not include students to whom rebates were granted. Counting the students to whom rebates were granted, we had a total registration of 1,135.

The Library Training Course, supported by the State Department of Education and under the direction of Miss Clara Baldwin, of the State Library Commission, had an enrollment of about fifty students. These students were not registered in the University courses.

Faculty.—Seventy-four persons gave instruction in the Summer Session, sixty-four of whom belonged to the regular faculties of the University.

Financial summary.—The receipts and disbursements were:

RECEIPTS

Fees	$15,740.00	
Shevlin Hall	3,881.89	
Sanford Hall	859.35	
State Department Appropriation	2,037.78	
Balance from 1915	4,362.25	
Appropriation for 1916	3,500.00	
Total receipts		$30,381.27

DISBURSEMENTS

Printing	311.58	
Incidentals	177.45	
Advertising	176.14	
Programs, music, and lectures	280.00	
Refunds of fees	681.90	
Instruction	14,037.38	
Shevlin Hall	3,258.13	
Sanford Hall	436.91	
Total disbursements		19,359.49
Balance		$11,021.78

The opening date.—The Summer Session was handicapped because it opened the week before the city schools of Minneapolis, St. Paul, and Duluth closed. As a consequence many students entered late and others felt that they were forced to attend elsewhere. In order to avoid this unfortunate situation next year, we asked the superintendents of Minneapolis, St. Paul, and Duluth when their schools would close in 1917 and they have informed us that the closing date will be June 15. We should open the Summer Session of 1917, Monday, June 18.

Advice to entering students.—Heretofore students desiring advice at the time of registration have been compelled to tramp about from building to building and from room to room seeking the instructors with whom they expected to take work. This year each department was requested to have a representative present on the opening day in the large room on the first floor of the Library Building. Every department in the College of Science, Literature, and the Arts, and in the College of Education responded to this request. A special table was provided for each department. This plan greatly facilitated registration and met with the approval of both the students and the instructors. It should be continued another year.

Difficulties in registration.—The plan in use at the Registrar's office for registering Summer Session students evoked much criticism. Many students were compelled to stand in front of the windows of the Registrar's office an unreasonable number of hours. We are convinced that there is no excuse for any system which makes it necessary for students to stand in line for hours before they can complete their registration. A radical change must be made another year or the criticism will be even more severe.

Registration cards.—At the present time it is not possible to distinguish by the cards issued by the Registrar's office between graduate and undergraduate students. As both classes of students are found in courses numbered between 100 and 200, and as different bases are used in reporting their grades, cards of different colors should be used in registering them.

Collegiate registrations.—We find that during the summer, students registering in Medicine and Dentistry indicate the college in which they are registering, but students do not do so in the case of the Colleges of Science, Literature, and the Arts, and Education. We believe that all Summer Session students should indicate their colleges during the summer in exactly the same way that they do during the regular year.

Time for registering graduate students.—One of the questions which has arisen during the summer session is whether graduate students should be permitted to register later than other students. This is a question which should be answered before the bulletin is prepared next year.

Payment of fees.—The question has been raised as to whether or not members of the Summer Session staff should be required to pay regular fees for courses. We insisted that the fees should be paid, altho we do not believe that the practice is right.

Issuance of rebates.—The system by which rebates have been granted in the past is extremely unbusinesslike. Altho the Director of the Summer Session is expected to sign the final requisition authorizing rebates, he has no memorandum on file showing that the rebates have actually been allowed. Rebates are granted to students who withdraw within a certain time after the opening of the session. In every instance the student desiring a rebate is expected to petition the Administrative Board. The Chairman of the Board is then expected to file an authorization with the Registrar, and the Registrar in turn files a statement with the Business Office. Actually, however, this procedure is not always carried out. Either the Director should authorize all rebates, or the Chairman of the Administrative Board should use a triplicate form in authorizing these, one copy to be filed with the Board, one with the Registrar, and one with the Director.

Convocations, Chapel Exercises.—Two general assemblies of the students and faculty were held, the first in the Armory and the second on the Campus Knoll. Chapel exercises were held regularly during the Summer Session on Tuesdays and Thursdays.

Trips, lectures, etc.—Trips, excursions, lectures, and chapel exercises were placed in charge of Professor J. S. Young. Public lectures were delivered by Mr. H. L. Southwick, Professor G. N. Northrop, Dean W. A. Jessup, and President George E. Vincent. One reception was held but it was not well attended. Attendance at receptions and other functions would be materially increased if a printed calendar and perhaps a special invitation were handed each student at the time of registration.

Social Director.—The social needs, particularly of the women students, are not well cared for in the summer. With the Director teaching ten hours a week and trying to look after the administrative details of the session, it is not possible for him to arrange for social functions. We believe there is no great danger that such activities would be indulged in to excess by the Summer Session students. In our opinion they represent an essential phase of university life, and to see that they are properly cared for, a social director of women should be appointed for the summer work.

Physical Education for Men.—This year an athletic committee was appointed for the purpose of providing opportunities for men students to play. This committee prepared rules for the use of the tennis courts and arranged for a series of baseball games. We regret to report, however, that the gymnasium and the swimming pool were closed during the entire summer. Another year they should be open and available for summer students.

We further believe that courses in Physical Education for Men should be given. Other institutions are paying particular attention to such courses. Two years ago the University of Illinois had 125 students who devoted all their time to the study of games. Practically every high school now gives some attention to tennis, baseball, football, and general gymnasium exercises. Most reputable high schools have a gymnasium

open to both boys and girls. Requests for teachers of physical education are increasing. The Department of Physical Education for Men therefore should be encouraged to offer courses in its various fields during the summer session.

Physical Education for Women.—We should like to call attention to the fact that the University of Minnesota has never provided any physical training for women during the summer. We believe that the physical education building should not only be kept open but that regular courses in physical education should be given.

The General Library and Departmental Libraries.—This year we tried the experiment of having the library open evenings. While reports do not show that the library was used as much as we expected, we believe that the opening of the library in the evening is a step in the right direction. The day is probably not far distant when the library should be kept open Saturday afternoon as well. Not all of the department libraries were open to students. We see no reason why arrangements should not be made so that every department may have its library open for the use of students who may be doing work in that particular field.

Summer Session Bulletin.—Another year the Summer Session bulletin should include a complete program showing the number of recitations in each subject, the days of the week and the time of the day when each recitation is to be held, and the building and room in which each recitation is to occur. All this information was collected this year but the Printing Committee declined to include it in the bulletin on the ground that it was a violation of the regulations. No rule of any sort should prevent the publication of this material another year.

Daily program.—Many students were prevented from registering in academic courses this year because instructors in the academic subjects felt inclined to place their classes during the early morning hours. We believe that the Director next year should distribute these courses over the day or that he should appoint a committee with authority to prepare such a program. There is no reason why classes should not be in session from eight o'clock in the morning until eight o'clock at night in case there is need for them.

Fourth of July vacation.—The Fourth of July vacation next year should be determined and indicated in the bulletin. Our experience with the vacation this year was not altogether pleasant. We found that the custom prevailed at Minnesota of permitting instructors to determine when the Fourth of July vacation should begin and how long it should be. This year, therefore, we sent a statement to each instructor informing him that there would be only one day of vacation and that there should be no shifting of classes or changes in the program. In spite of this, some instructors disregarded the rule, and arranged for their students to be absent on both the third and the fourth of July, and others on the fourth and the fifth of July.

Graduate work.—More graduate courses were offered this year and more graduate students were in attendance than ever before. Last year

we had 62 graduate students, this year, 85. A still greater number of graduate courses should be offered next year. The Summer Session rightly managed provides an unusual opportunity for building up the Graduate School. Each department should offer at least one graduate course and many departments should offer more than one.

Salary schedule.—This year instructors were paid one ninth of their annual salaries, with the understanding, however, that no one should receive less than $150 and no one more than $375. A few persons employed from the outside were paid more than $375 but no one on the regular staff of the Colleges of Science, Literature, and the Arts, and Education received more than this amount. We are inclined to the opinion that the preparation of a salary schedule for the summer session would be much easier if a definite scale were fixed, altho we realize that such a scale might be unfair to an occasional individual. If professors were paid $350, associate professors $275, assistant professors $200, and instructors $150, the total would not vary greatly from our present total, and the administration would be simpler.

Teaching hours.—This year we increased the salaries of instructors and reduced the number of hours they were required to teach. Each instructor received full pay if he taught a minimum of twelve hours and no extra pay if he taught more than twelve hours.

Number of hours per course.—During the regular year a course that recites three times a week receives three credits, a course that recites two times a week receives two credits, etc. In a three-credit course there are about 48 recitations a semester; in a two-credit course there are about 32 recitations. We therefore insisted that in a three-credit course there should be approximately 48 recitation hours, in a two-credit course 32 recitation hours and in a 1½-credit course 24 recitation hours. It was presumed that when any course was offered carrying one and one-half credit hours that a definite unit of subject matter would be covered and that another definite unit of subject matter would be covered the succeeding summer so that students could earn three credit hours in this subject in case they attended two successive summers. It is unfortunately true, however, that a few instructors did not seem to understand conditions and attempted to give their full courses when they had listed them for only one and one-half credit hours.

Graduate courses and credit hours.—Since the Graduate School permits students to earn their master's degree in four summers of six weeks each, and since it requires a minimum of nine hours in the major subject, it will be necessary for us to offer at least one graduate course of at least three credit hours in each department.

Protecting the student.—Practically every student thinks that he is a special case and that he should be permitted to carry more than the minimum of six hours. This privilege should be granted only in rare instances. Generally speaking, we believe that it is a good thing for a student to carry at least one course in some department other than his major. We are very certain that no department should be permitted to

offer a full year's work and permit a student to attempt to cover that work in six weeks' time.

Length of term for next year.—The question has been raised as to whether we should have a six weeks' term or an eight weeks' term. A year ago Professor Young filed with you the following reasons for lengthening the summer session:

1. The University Plant represents a large valuation. The state should utilize the plant as much as possible.

2. Students who attend summer schools wish the opportunity of earning more than six credits. The University of Chicago has made a great success by affording an opportunity to persons who are usually occupied with earning an income during most of the year but can study during the summer. Many persons in the United States now hold higher degrees because of the four-quarter system in Chicago. Last year 22 persons pursued graduate work during the summer. This year almost three times as many did graduate work. One of the surest ways to build up graduate work would be to lengthen the time.

3. Lengthening the time will give an opportunity to provide for a much needed flexibility in courses, that is, the double-period courses could be abolished. Three double-courses do not serve the highest educational purpose. It would increase the number of courses and make a wider appeal.

4. Several of our sister state universities are offering more than six weeks in the summer session. Illinois and Michigan have eight weeks; Indiana, Kansas, Missouri, and Nebraska, nine weeks; and Iowa, ten weeks. If these institutions can successfully maintain more than a six weeks' term the University of Minnesota is lagging behind. Minnesota can have as large a summer school as any state university in the country if it will devote the necessary money to the Summer Session. More advertising of our advantages should be done. Professor J. C. Posey furnished me a statement in regard to weather conditions in Minneapolis. That summer school students here find the climate well-suited for summer study is amply borne out by the records of the United States Weather Bureau. The moderate heat of the day is succeeded by cool nights, which is shown by the fact that the average of the highest temperature of each day for June, July, and August for a period of twenty-five years is 79 degrees, while the average of the lowest daily temperatures for the same period is but 59 degrees. The higher temperatures experienced are rendered less trying by the low relative humidity accompanying them. Situated as Minneapolis is in the path followed by the high and the low barometric pressures as they travel across the continent, the occasional hot spells are never of long duration and they are always succeeded by bracing weather that counteracts their ill-effects. Long droughts and the trying weather incident to them are extremely rare. The normal rainfall for June is 4.01 inches; for July 3.81 inches; and for August 3.49 inches. Since the rains are of the thunder storm type none is of very long duration. The average wind velocity of nearly ten miles an hour indicates

that still, sultry days are comparatively few. In addition to the fine climatic conditions, the University is located in a city which should appeal to many students because of the fine parks, drives, and places of interest. Altho the University is located in a city, it is close to the pleasant summer lake resorts. All these advantages make our location an ideal one for the summer session when compared with many other university locations.

You will note that in the fourth of these reasons, Professor Young cites the schools that have summer sessions that are longer than six weeks. I should like to call attention to the fact that Kansas does not have the nine weeks session any longer but that both Kansas and Iowa have a ten weeks session divided into two parts, one six weeks and one four weeks in length. Columbia, Chicago, Wisconsin, each has a six weeks' session.

Appropriations for the Summer Session.—The summer session is just now beginning to be self-supporting, but it would not be self-supporting in case we paid all the bills and met all the expenses that many people think should be charged to it. There are those who insist that we should have departmental budgets for the purchase of supplies, that we should pay overhead charges for the Registrar's Office, the Business Office, the Printing Office, etc. These are problems which must be disposed of in the near future.

If the University of Minnesota is to *develop* its Summer Session, it should have an increased appropriation from the State. Both the State of Illinois and the State of Iowa now appropriate $25,000 for the maintenance of their summer sessions. If the State of Minnesota gave a like amount, it would be possible for us to reduce the fees somewhat. At present we are charging our summer students much larger fees proportionately than we charge the students of the regular year. In fact, during the regular year a student paying $40 in the Colleges of Science, Literature, and the Arts, and Education may earn 30 credits, but during the summer, he pays $17 and can earn only six credits. In other words the rate is twice as high in the summer as during the year. At Illinois, teachers pay no tuition fee during the summer and the maximum fee for all other students is $5. Graduate students are not required to pay fees during the summer at either Illinois or Iowa.

Administrative Board.—We made an effort this year to check the attendance of students. Professor E. E. Nicholson, Chairman of the Administrative Board, assisted in checking both the absences and the scholarship of students.

Decentralized control.—We have already pointed out some of the difficulties with the administration of the Summer Session. The chief difficulty, however, is to be found in the fact that the University does not attempt to maintain uniform standards and policies in administering the Summer Session. For example, the University encourages the maintenance of four separate and distinct summer sessions, one in the College of Dentistry, one in the College of Medicine, a third in the College of

Agriculture, and the fourth in the Colleges of Science, Literature, and the Arts, and Education.

The College of Dentistry has absolutely no connection with the general summer session. The instructors who shall be on the dental staff, their salary schedule, the courses that shall be offered, etc., are all determined independently of the Director.

A similar situation prevails in the case of the College of Medicine. This college prepares a separate bulletin and maintains a separate and independent summer school. Students were notified that they should appear at the office of the Assistant Dean of the College of Medicine if they desired to register in any courses offered in that college. The budget prepared by the Medical School was not submitted to the Director. At least two men on the medical staff received salaries far in excess of the salaries paid to men in other departments of the University.

The College of Agriculture maintains a separate school also. As far as we have been able to discover the Director of this school is appointed by the College of Agriculture and not by the Board of Regents. The money for the maintenance of this school seems to be appropriated by the College of Agriculture. At any rate it is not included in the total fund appropriated for the maintenance of the Summer Session.

The decentralized control which characterizes our administration results in confusion, in the maintenance of different standards, in unnecessary expenditures, and in varied policies. Confusion is seen when students desire to register in different colleges. For example we know that certain students have felt when they paid their fees for college work at the College of Agriculture that they should be privileged to carry work on this campus. Others who paid their fees on this campus felt that they were entitled to carry work at the College of Agriculture. This, we believe, is a privilege which they should enjoy. Occasionally students do manage to register in agriculture and in arts or education. In every instance they are required to pay both fees but there is no system in vogue to check the amount of work that such students are carrying. For example, our attention was called recently to a student who carried four and one-half hours on this campus and full work at the College of Agriculture.

The procedure of permitting one college to offer courses in the summer without having the sanction of the department or college in which these courses should be properly listed is doubtful, to say the least, and yet that is exactly what we are doing in the case of courses in education which are offered to students at the College of Agriculture without the knowledge, sanction, or approval of the Dean of the College of Education.

The unnecessary expense involved in attempting to maintain different summer sessions is shown in the bulletins and pamphlets which are published for the purpose of advertising them and in paying half a dozen or more men for their administration. Differences in standards will necessarily prevail so long as the University appoints a Director and at the

same time recognizes men in other colleges as having power to determine policies, to employ men, to arrange for examinations, vacations, and the like.

We are convinced that these facts describe a situation which is unwarranted no matter what traditions may be back of it and yet if this University expects to continue to permit separate colleges to operate independent summer sessions, then the College of Education should provide for a summer school of its own. Certainly three fourths of the students registered this summer would have registered in the College of Education. If this College had control of the fees which are received for such students it could provide more adequately for their needs. It is because we believe it would be contrary to the best interests of the University for the College of Education to establish a separate summer school, that we suggest that the whole question of its administration should be given careful consideration.

Respectfully submitted,

L. D. COFFMAN, *Director*

DEPARTMENT OF PHYSICAL EDUCATION FOR MEN

To the President of the University:

SIR: I herewith submit my report for the year 1915-16 together with some recommendations for the future.

Staff.—The staff of the Department of Physical Education for Men consists of a director, an assistant director, an instructor, a clerk, a locker room attendant, an instructor in swimming and corrective gymnastics, and three assistant medical examiners.

Chief tasks undertaken by the department.—

1. Physical examination of all new matriculants and all those using the privileges of the department, and medical inspection of same.
2. Administration of a special lecture on sex hygiene.
3. Disease census of all new matriculants.
4. Conducting organized classes in personal hygiene and gymnastics for all students in the College of Science, Literature, and the Arts.
5. Conducting of special classes for defectives in all colleges of the University.
6. Promotion of intramural sports, such as football, baseball, basketball, handball, tennis, swimming, etc.
7. Promotion of miscellaneous sports and physical activities including gymnastics, wrestling, swimming, soccer, and the work of Sigma Delta Psi.
8. Promotion of minor intercollegiate athletics.
9. Organization and administration of special features of physical education.

Physical examination.—

1. A careful medical and physical examination is given all students entering the University for the first time. This required examination includes a personal history of the student; inspection and examination of heart, lungs, nose, throat, teeth, eyes, ears, skin, and body in general; prescription of corrective exercises.
2. Medical inspection is required of all students using the department privileges, such as shower baths, swimming pool, towel exchange, gymnasium, training quarters, and athletic fields.
3. A second physical examination, at the end of the school year, is required of all students registered for the regular gymnasium course.

During the year a total of 2,825 examinations were made by the Staff of Medical Examiners, divided as follows: 1,209 original examinations with measurements, 452 reëxaminations with measurements, 680 medical inspections, and 484 emergency examinations for students temporarily disabled for gymnasium, drill, or other work, or desiring first-aid treatment for injury. No records were kept of a large number of conferences with individual students concerning matters of personal health.

Special lecture.—A total of 1,609 students attended the special lecture on sex hygiene as required of all students entering the University and Farm School for the first time. This lecture was given in six divisions, five of which were at the University and one at the University Farm. The following staff delivered the lectures: at the University, Drs. J. C. Litzenberg, C. A. Erdmann, S. Marx White, H. L. Williams, Earl R. Hare; at the Farm School, Mr. A. J. (Dad) Elliott, Western Secretary, Y. M. C. A. International Committee.

Disease census.—A total of 1,330 disease census cards, properly filled out and signed, as required of all new matriculants, were collected. The cards were sent to the Epidemiological Division of the State Board of Health for recordation of data, and later were returned to the files of the Department of Physical Education for Men.

Gymnasium classes.—Six hundred eighty-three students were enrolled in organized gymnasium classes. Regular classes were conducted twice each week as required by the curriculum. These classes were given in four sections, each containing from 100 to 150 students. During the first six weeks of the school year, the work consisted of a course of lectures on personal hygiene, with a written examination at the end of the course. The remainder of the year was devoted to regular gymnasium class work, which included calisthenics, elementary apparatus drills, marching, class tactics, running, and athletic games. All students taking this course are required to pass eight efficiency tests for credit in gymnasium. Three of these tests are required in the first semester, and five the second. The former are in swimming, bar vaulting, and set exercises on apparatus; the latter, in life saving, running, jumping, and apparatus work. The standards required in all the exercises are such that the average student, with the training given, can meet them, and are the result of careful study by the Department.

Corrective gymnastics.—All defectives are grouped according to condition, and are under the direction of an instructor, who directs the execution of corrective exercises, as indicated. These defectives are excused from the qualifications required of other students, but are required to come three times each week for work. All students whose petitions are granted for excuse from military drill on account of physical disability are assigned to one of these classes.

Intramural sports.—Interclass contests were held in basketball and baseball, and intercollege contests were held in football, basketball, baseball, handball, hockey, swimming, and track. (See report of Intramural Sports Committee.)

Miscellaneous physical activities.—1. Special classes were held in elementary, intermediate, and advanced gymnastics, and most of the students registered in these classes (about 60) participated in the Northwestern Gymnastic Meet, which is held annually at the University, and is composed of gymnastic teams from colleges, normal schools, high schools, Y. M. C. A.'s, Turnvereins, settlement houses, etc., from various parts of the state.

2. Sigma Delta Psi, the honorary athletic fraternity, is well established at Minnesota. The candidates enrolled for the society during the year numbered about 100.

3. The department had an organized Leaders' Corps as in former years. The work consisted of coaching leaders for elementary apparatus work. Such of these leaders as cared to follow up the work were given the opportunity to register for advanced leadership with credit, and were placed in charge of classes under supervision of a member of the departmental staff.

4. The Director of the Department is western member of the National Collegiate Basketball Rules Committee and compiles all collegiate statistics in his territory of ten states, besides collecting photographs of teams, lists of names of captains, managers, and coaches, and writing up the Middle West Conference season for publication in the basketball guide.

5. This department has been active in the promotion of an intercollegiate basketball conference, for interpretation of rules, making of schedules, and selecting officials for games and the Director of the Department is secretary of the association.

6. A Tri-State basketball organization, patterned after that of the Western Conference, is promoted by this department, and the Director is president of this organization. The annual meeting was held on Saturday of Thanksgiving week, and was attended by twenty college representatives and sixteen officials. This organization has become very popular with all of the schools in Minnesota, North and South Dakota, Northern Iowa, and Western Wisconsin, and its regulations govern the administration of rules in this section. The meeting is now held in connection with the Minnesota-Dakota Athletic Conference and is an official interpretation and schedule-making organization.

Intercollegiate competition.—Competition in intercollegiate athletics in the University is of two kinds: one, including football, baseball, basketball, and track, is carried on by the Athletic Association without connection with this department. The other is promoted by this department, but is financed by the Athletic Association, and includes gymnastics and wrestling. Swimming, which was taken up by the athletic association last year and put on the same basis with wrestling and gymnastics, was dropped this year as an intercollegiate sport.

1. The University gymnastic team competed in the Northwestern Gymnastic Meet, and also in the Western Intercollegiate Meet, both of which were held at the University of Minnesota. The University team was awarded Class A honors in the Northwestern, and also the Individual honors in the Western Intercollegiate.

2. The wrestling team participated in an All-University tournament, held in five different weights, and also competed in the Western Intercollegiate wrestling meet which was held here at Minnesota in connection with the Gymnastic Meet. The team made a good showing, and was awarded one first and one second place.

New features added during the year.—The Academic fraternities were organized into an interfraternity athletic association, with constitution and by-laws and other regulations for putting interfraternity competition upon a more substantial basis.

Recommendations for the future.—In view of the physical well-being of all men in the University, two urgent needs are again called to your attention: (a) a new gymnasium; (b) more ground for intramural sports.

1. The gymnasium for men is located in the Armory Building. This building also houses the Military Department, with an enrollment of 1,510 students, which has a drill schedule requiring the use of the building 30½ hours a week. This includes one morning, three afternoons, and an evening. The building also houses the Athletic Department with offices, storerooms, baths, and locker rooms, and schedules calling for the daily use of a considerable part of the building for track, football, basketball, etc., during the winter months. In addition, the building is used for various mass meetings, convocations, and social gatherings regularly throughout the college year. This leaves a limited amount of time for the Department of Physical Education, with its required course in physical training for about 650 students, and intramural games, comprising interclass, intercollege, and interfraternity contests, and various activities such as gymnastics, boxing, wrestling, fencing, swimming, etc., and leaves practically no time for the optional use of departmental privileges by the mass of students, and faculty members, whose programs will not permit their taking part in organized class work. We are overcrowded and unable to do efficient work; the present building is not now, and never has been, able to meet the needs of the University. It is not adapted for physical education either from the standpoints of utility or sanitation. In view of these facts it is recommended that ample provision be made for the physical welfare of the large and growing male student body of the University, and that a gymnasium commensurate with the needs of the University be provided.

2. More ground for intramural sports must be provided soon, or the progress which is being made in this most desirable feature of physical education may be arrested. At the present time, practically all of the outdoor games are played on the parade grounds, when not in use by the Military Department, and on the east river flats, by courtesy of the Minneapolis Park Board.

Respectfully submitted,

L. J. Cooke, *Director*

DEPARTMENT OF PHYSICAL EDUCATION FOR WOMEN

To the President of the University:

SIR: I submit herewith my report for the year 1915-16.

New building occupied.—In September, 1915, the department moved into its new building, the women's gymnasium; the stimulus afforded by adequate accommodations has notably quickened the interest of the students in their work. Certain confusion and delays were inevitable because the building was occupied before its mechanical equipment was in good order, but most of these obstacles were removed in due course. The natatorium, however, was not ready for use during the year.

Physical examinations and consultations.—1. Full examinations were given to the following groups of students:

a. In all colleges, 629 examinations of newly entering students.

b. In the Schools of Agriculture at St. Paul and at Morris, 145.

c. Eighty-eight seniors who were candidates for teachers' certificates in the College of Education were examined, and careful estimates of their vigor, dependent on their examination and on their health history during their college life were furnished to the college for its guidance in placing teachers in positions where they might be expected to render efficient service.

d. Reëxamination was made in the spring of all students in the required and credit classes, 394 in all.

2. Required health consultations:

a. All applicants for a reduction of college program on account of physical weakness or ill health were interviewed, and if their request was approved they were required to carry out definite prescriptions of exercise or rest or to put themselves under proper medical guidance.

b. All sophomores and juniors were interviewed in personal consultation and were given advice for the promotion of their health, 382 in all.

c. The weekly hygiene records are assuming more importance all the time in serving as a basis for personal consultations with freshman students who have not yet learned how to take proper care of themselves. More than 150 freshman students were called in for consultation this year.

3. Records of all consultations held by the nurse at Sanford Hall were placed on file with the other data concerning the student's health, and form a valuable addition to the knowledge which the department has of each student.

Courses in Hygiene.—The same courses were offered as in 1914-15.

Exercise, required.—All newly entering students took the elementary work. The accommodations in the new gymnasium made it possible to carry out a long cherished plan for grading the girls according to physical condition into three groups, the strong, the fairly vigorous, and the group

which for special reasons needed such careful supervision as could be given them in a small class of ten or a dozen members. The "fairly vigorous" group corresponded to the group of girls who had been held for gymnasium work on account of physical condition in previous years. The girls who in previous years would have been excused from all required exercise were put into the strong group, while the "corrective class" made it possible to deal helpfully with cases of spinal curvature, markedly poor posture, weak feet, weak hearts, recently operated students, etc. The results were gratifying. Four hundred seventy-six students were registered in these courses as against 225 in 1914-15.

Exercise, elective.—Groups were organized as follows:

	1915-16	1914-15
Intermediate gymnastics	45	37
Advanced gymnastics	16	*
Social dancing	130	95
Elementary gymnastic dancing	32	50
Advanced gymnastic dancing	15	
Organized games	15	*
Field hockey	30	*
Basketball	86	94
Tennis	†	33
Baseball	60	43
Swimming	‡	144§
Fencing	18	14
Total elective enrollment	447	510
Total required enrollment	476	225
Total enrollment	923	735

* Not given in 1914-15.
† No classes were organized.
‡ The new swimming pool was not ready for use.
§ Armory swimming pool.

The Woman's Athletic Association.—The report of the Committee on Intramural Sports deals with details of the contests held by the Woman's Athletic Association. One new activity which has been taken up this year deserves special mention. A play hour has been successfully conducted every other Friday afternoon at five o'clock in the gymnasium to which any girl who wished vigorous recreation has been welcome. The average attendance was thirty-five.

Officers employed.—The staff of the department has consisted of the director, three instructors, a secretary, a pianist, a matron, and an auxiliary staff of three women physicians.

Recommendations.—1. I would recommend that the requirement in Physical Education be extended to include the sophomore year. With our gymnasium and playground equipment, we ought to be reaching a much larger proportion of the students than at present. Elective classes and freedom to use the swimming pool help the situation, but our health consultations with sophomores and juniors disclose a marked lack of

exercise of any sort in a majority of cases. Sophomore classes should be varied in election and limited in size in order to favor the acquirement of that skill which tends toward establishing a lasting interest in exercise.

2. I would repeat the recommendation made in my report of 1913-14 concerning the organization of a professional training course in physical education leading to a degree. The basic scientific and educational training could well be carried on in the departments which are equipped for that work, while the theoretical and practical courses in exercise and the supervision of practice teaching, for the women, could be handled by this department, using the equipment of the new gymnasium and a somewhat increased staff. Both from the standpoint of offering an opportunity within this state for young people to receive thoro training in this specialty, and from the standpoint of providing well-trained teachers for the schools of the state, there is real need for the careful organization of such a course.

Respectfully submitted,

J. ANNA NORRIS, *Director*

COMMITTEE ON PHYSICAL EDUCATION AND INTRAMURAL SPORTS

To the President of the University:

SIR: I have the honor to report as follows on the work of the Committee on Physical Education and Intramural Sports for the year ending July 31, 1916. Reports on Physical Education for men and for women will be submitted separately by Doctors Cooke and Norris. This report will deal with intramural sports only.

Football.—The second year of inter-college football was played on the elimination system as in the previous year. The series ended in a tie between the teams from the Law School and the College of Agriculture. The championship was awarded to the Laws. The following men played on the Law team: Regan, Ruth, Davis, Townley, Holdhusen, Costello, Shelly, Mayer, Clancy, Johnson, Bolsta, King, Dougherty, Lyons, Sullivan. It is estimated that 120 men played on the various college teams during the season. Football is badly handicapped by lack of suitable playing fields.

Tennis.—In the fall of 1915 and the spring of 1916 singles and doubles were played in all-University tournaments, and in the spring of 1916 singles and doubles were played in an inter-college tournament, the first for the University. Owing to bad weather and short playing seasons, the all-University tournaments were not completed. The inter-college singles and doubles were won by men from the College of Science, Literature, and the Arts. Two hundred and thirty men competed in the various tournaments.

Basketball.—In basketball, inter-class, inter-college, and inter-fraternity games were played. Fifteen teams with 120 men competed in inter-class games, and eight teams with 80 men competed in the inter-college series, which was won for the third successive year by the team from the Law School. An inter-fraternity tournament with 20 teams and 200 men was won by the Sigma Chi team. In all 400 men competed in basketball in the three tournaments.

Handball.—Two tournaments were run off in handball during the year, an all-University and an inter-college. The all-University doubles were won by S. Aronson and Haedge. The singles championship was won by A. Aronson. The inter-college championship was won by the team from the College of Science, Literature, and the Arts. The men on the team were Riley, Abramson, Kulberg, and Ecton. The winners in both of these tournaments were awarded jerseys, in University colors.

Hockey.—The second year in hockey was far more successful than the year preceding. The Campus Club Cup for inter-college hockey, which was won by the School of Mines during the winter of 1914-15, was won by the team from the College of Engineering. It is estimated that sixty men played on the various college hockey teams. The winning team

was awarded jerseys. Besides the inter-college tournament, a very excellent series of games was played by teams from eight fraternities. This series was won by the S. A. E. fraternity who were awarded the blanket pennant in varsity colors given by the Spalding Company. About 130 men competed in inter-college and inter-fraternity games. Hockey and skating in general will not receive the support they should until a way can be found to secure an expert in the maintenance of a good ice surface. Poor ice has been the greatest factor in keeping students away.

Swimming.—In the intercollege swimming meet held in April the "Deans' Cup" was won for the third successive year by the team from the College of Engineering. This makes the College of Engineering the permanent holders of this cup. In this meet it was decided to award swimming suits in varsity colors to point winners only. Ten men from various colleges won this trophy. The annual interfraternity relay, in which forty men competed, was won by the Delta Kappa Epsilon team.

Baseball.—A series of interclass games was scheduled but was not fully played out, there being an evident lack of class spirit. In the intercollege series, nine teams were entered and a schedule of thirty-six games was played. The championship was won by the College of Medicine with the following team: Proshec, Sprafka, Selleseth, Gausemel, Sutton, Dack, Heimark, McLocklin, Gallagher, Boquist, Wyatt. Jerseys in varsity colors were awarded the team.

An interfraternity tournament with 22 teams entered was played. In this tournament it is estimated that over 260 men were engaged. The tournament was won by the Phi Kappa Sigma team which defeated the Alpha Tau Omega team in the final game. In the three tournaments, interclass, intercollege, and interfraternity, it is estimated that 400 men played.

Baseball is handicapped by lack of suitable playing fields, the overlapping of the outfields of two diamonds making it often dangerous to players.

Wrestling.—An intercollege wrestling tournament which was won by the team from the College of Agriculture, was held in March, 1916. Twenty-five men competed in this tournament.

Track.—During the year, five indoor meets were held; the all-freshman, freshman-sophomore, the Agricultural College class meet, the all-University, and the novice meet. All-freshman, novice, freshman-sophomore, and all-University meets were held on Northrop Field during the spring and early summer months. In these indoor and outdoor meets, together with the interfraternity relay race, the cross country race and hare and hound runs, over 200 men competed, or an increase of more than 20 per cent over the previous year. Track work would develop rapidly if better facilities for training were available.

Sigma Delta Psi.—The Athletic Fraternity, Sigma Delta Psi, has been placed under the supervision of the Committee on Intramural Sports, the members of which act as a certification committee at the trials that are

held frequently during the year. It is estimated that one hundred men participated during the year.

Notes and recommendations.—The Committee has been unable to do what should be done, on account of a lack of financial support. The Athletic Association has given money from time to time to pay for expenditures that were unavoidable. The upkeep of tennis courts, etc., has been taken care of by the Superintendent of Buildings and Grounds, but the University still lacks a single good football field for other than intercollegiate athletics. There is one good baseball field on the main campus and two poor ones, for the accommodation of thirty to forty teams. Handball is confined on the main campus to four small and poorly ventilated courts, the combined floor area of which is less than 115 square yards.

In view of the growing numbers participating in intramural sports and inadequate space for taking care of the work, it is evident that there is an imperative need for more indoor space for such winter games as basketball and handball and more and better fields for such sports as tennis, baseball, and football.

The greatest necessity is for more grounds, with provision for fitting and keeping the fields in good playing condition. It is to be hoped that we may within the coming year or so take advantage of the opportunity that will be offered of introducing rowing as an intramural sport.

In closing I should like to repeat the recommendation of the report of the previous year: that the University should employ an expert in the building and maintenance of tennis courts, baseball fields, skating rinks, football fields, etc., and that such an employe devote his entire time to this work.

Respectfully submitted,

OTTO S. ZELNER,
Chairman, Committee on Intramural Sports and Physical Education

REPORT ON CONTESTS HELD BY WOMEN STUDENTS

Tennis.—Two tournaments were held, one in the autumn semester and one in the spring semester, for the students on the main campus and the students on the Agricultural campus under the direction of the Women's Athletic Association. A silver cup was offered by Jacobs, for the autumn tournament, and one by Weld, for the spring tournament, on the main campus. These cups are kept by any students who win the tournament two years in succession; otherwise, they are held in the possession of the winning girl until the corresponding tournament of the next year.

Field hockey.—This sport was organized for the first time during the fall term. Two teams were chosen, the Reds and the Greens. A tournament was held in which great enthusiasm was shown by the fact that often the students, themselves, had to shovel the snow off the hockey field in

order to play their games. The final game was held the day before Thanksgiving.

Basketball.—The Women's Athletic Association held a basketball tournament from April 3 to April 14, 1916. The schedule included six preliminary games, representing six teams, first and second freshman teams; first and second sophomore teams; first and second junior teams. On April 14, two public games were played, a championship game between the juniors and sophomores, the juniors winning the championship, and a final game between the two winning sorority teams, Alpha Xi Delta vs. Kappa Alpha Theta. This was won by Alpha Xi Delta. The winning class team had their names engraved on a silver cup presented by Hudson. One hundred girls were enrolled for basketball practice during the winter. A sorority basketball tournament was held for the first time during this year, eleven out of twelve sororities entering. The final game was played off on the night of the final class game, April 14.

Skating.—On account of the lack of good ice, there was not much development in skating. Two teams in ice hockey were organized under the direction of the Women's Athletic Association.

Swimming.—No swimming was given on the main campus owing to the fact that the natatorium was unfinished. The girls on the Agricultural campus held a contest late in the spring.

Gymnasium contest.—One hundred and ninety-two girls, representing four gymnastic sections, two dancing sections, and one fencing section, took part in the gymnastic contest under the direction of this Department on the evening of April 17, 1916. The program included marching, running, floor work, apparatus work, gymnastic dancing, fencing, and a game. The attendance was voluntary and the audience was composed largely of guests of the students. A banner was presented to the class winning the most points in floor and apparatus work. A plaque was presented to the winning dancing class.

Baseball.—Sixty girls reported for baseball practice. Four class teams were organized and a tournament for the championship was played off. A team chosen from the four class teams played a similarly chosen team from the Agricultural College on Field Day.

Field Day.—Date, May 20, 1916; place, playground on river bank opposite Elliot Hospital; program, (1) baseball game between the students of the main campus and the Agricultural campus; (2) newcombe, between the two winning gymnastic squads; (3) volley ball, between the two organized game classes; (4) cricket, between the intermediate and advanced classes. This second Field Day was much more of a success than the preceding one, and ended with novelty races and a picnic on the river bank.

Respectfully submitted,

J. ANNA NORRIS, *Secretary*

THE MILITARY DEPARTMENT

To the President of the University:

SIR: I submit herewith my report for the University year 1915-16.

Enrollment.—The number of cadets under instruction during the year was as follows:

College of Science, Literature, and the Arts	620
College of Engineering	306
College of Agriculture	279
College of Dentistry	158
School of Mines	22
College of Pharmacy	42
School of Chemistry	21
School of Agriculture	206
Total	1,648

Encampment.—The first compulsory encampment was held at Fort Snelling, Minnseota, from June 1 to 7, inclusive. The attendance was 846.

Inspection.—The annual inspection for the War Department was made by Major Munroe McFarland, General Staff, U. S. Army, on May 5, 1916. The following remarks from the inspector's report show that the Military Department had a most successful year:

"I called upon and was very cordially received by President George E. Vincent, who was present during most of the inspection. Arms and equipment were in excellent condition. The execution of ceremonies, drills, detachment work, field maneuvers, showed the result of hard and intelligent work in preparation. The military department is in a very satisfactory condition."

Classification and Honor Graduate.—For the third consecutive year the University was placed in the distinguished class, which gives the military department a complete new equipment of the latest model thus replacing the obsolete equipment used by the department for so many years. Mr. George N. Ruhberg, Medic '18, has been reported to the War Department as Honor Graduate.

Recommendations.—A new Armory is badly needed by this department, the present one being entirely too small. In addition it is occupied by other departments and apparatus always has to be removed before this department can use the floor space to any advantage.

Respectfully submitted,

G. W. MOSES,

Major 16th U. S. Cavalry, Professor of Military Science and Tactics

THE GEOLOGICAL SURVEY

To the President of the University:

SIR: I herewith submit my report as Director for 1915-16.

Organization and coöperation.—The Minnesota Geological Survey was allotted $16,500 for the biennial period, begun August 1, 1915. The arrangement for coöperation with the United States Geological Survey, as outlined in the report of the Director for 1911-12, and published in the *President's Report* of the University of Minnesota for that year, was renewed for the year ended August 1, 1916. According to this plan each organization shares equally the cost of field work and the publication of reports. The responsibility and credit for these reports are shared equally by the two bureaus and the joint reports are so announced on their title pages. Parts of editions are announced as Minnesota publications in coöperation with the Federal Survey, and parts are announced as United States Geological Survey publications in coöperation with the University. This plan has many advantages, for the fund available is increased, and moreover, the State Geological Survey has the advantage of criticism of specialists and map and manuscript editors of the Federal Survey. The arrangement is to be terminated when unsatisfactory to either bureau, and when desirable publications may be issued independently by the State.

The Minnesota Geological Survey is coöperating also with the Bureau of Mines, Washington, D. C., in the investigation of peats in Minnesota, and coöperation has been continued with the School of Mines Experiment Station and with the School of Chemistry of the University of Minnesota. During the past year the School of Mines Experiment Station has made certain mill tests on low-grade iron ores and the School of Chemistry has made chemical analyses at the request of the Geological Survey. Valuable assistance has been given this Survey, also, by Professor F. J. Alway and other members of the Division of Soils of the Department of Agriculture, and duplicate samples of peats collected by the Survey have been supplied to the Bureau of Soils.

Topographic work.—For several years the State Drainage Commission has coöperated 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. With few exceptions Minnesota has a smaller percentage of its area topographically surveyed than other states in the Union. It is vitally important that the appropriation for this work be restored.

Field work.—During the past field season, from about June 15 to October 15, 1916, the following work was carried on in coöperation with the United States Geological Survey:

1. An investigation of the surface formations of Minnesota with special reference to the soils. This work has been completed. A map

of the northwest quarter of Minnesota has been engraved and issued, accompanying *Bulletin 12*, which is entitled *Surface Formations and Agricultural Conditions of Northwestern Minnesota*. A map of the northeast quarter of Minnesota has been engraved and will be issued to accompany *Bulletin 13*, which is entitled *Surface Formations and Agricultural Conditions of Northeastern Minnesota*. The map of the southern half of Minnesota also has been completed and is being engraved. It will be published and issued with a bulletin describing *The Surface Formations and Agricultural Conditions of Southern Minnesota*. This bulletin will be published as soon as funds are available. These three bulletins are based on several years' field work. The investigation will no doubt be of great value to farmers, and especially to colonists. It will aid also a more detailed survey of the soils in which small parcels of land, such as forty acre tracts, are treated, rather than their relations to large soil belts and areas the nature of which is determined by the major features of their geological history. This work has been done by Dr. Frank Leverett of the United States Geological Survey, assisted by Dr. F. W. Sardeson. Mr. U. G. Purssell of the United States Weather Bureau prepared, without cost to the State, a chapter for these bulletins on the climate and weather conditions of Minnesota.

2. An investigation of the peat deposits of Minnesota. This work has been completed. Mr. E. K. Soper has been engaged in this work for about three years. The investigation has been carried on in coöperation with the United States Bureau of Mines and the United States Geological Survey, the United States Bureau of Mines being represented in the survey by Dr. C. A. Davis. Owing to the unfortunate death of Mr. Davis, the completion of the report was left in the hands of Mr. Soper. In this report the peat areas are outlined and many soundings are reported. A large part of Minnesota is covered by peat. The deposits are the largest in the United States and will some day become important economic assets. The increasing prices of coal should cause attention to be directed to this important source of fuel in the near future.

3. The survey of the geology and iron deposits of the Cuyuna iron range has been continued throughout the year. This work has been in charge jointly of Dr. E. C. Harder of the United States Geological Survey and Mr. A. W. Johnston of the Minnesota Geological Survey. Mr. L. G. Ravicz and Mr. E. A. Sweetman of the University of Minnesota have served as assistants. This investigation involves the close study of a large area in which the hard rocks are exposed only here and there. A large part of the data necessary to a rational interpretation of the structure is derived from examination of drill cores which is necessarily a slow and painstaking method. A preliminary report of the economic geology of this region will be issued in 1917.

4. Investigations of the magnetites of St. Louis, Lake, and Cook counties have been continued. This work has been in charge of Professor F. F. Grout and Mr. T. M. Broderick. Mr. A. I. Levorsen has served as assistant and Mr. John A. Moga and Mr. J. C. Barr, Jr., as compass-

men and packers. Several areas of magnetic attraction were mapped in detail.

5. In addition to the more comprehensive investigations outlined above, many inquiries are received in the offices of the Survey concerning the geological structure in various places by those who contemplate drilling for water or ore, and numerous materials are forwarded from various localities in the state to be examined to determine their availability for various economic purposes. Requests of this kind are increasing. Five years ago about two hundred specimens were examined and reported on annually. The use of this service has grown so that now there are nearly two thousand specimens sent in annually.

Publications.—The following publications have recently been issued by the Survey and are for sale by the Librarian of the University:

Bulletin No. 11. Preliminary report on the clays and shales of Minnesota. By F. F. Grout and E. K. Soper. 8vo., 172 p., illus., pl., charts. Bd. $1.00; unbd., $0.75; postage 7 cents additional. 1914.

Bulletin No. 12. Surface formations and agricultural conditions of northwestern Minnesota. By F. Leverett and U. G. Purssell. $0.25; postage 5 cents additional. 1915.

Bulletin No. 13. Surface formations and agricultural conditions of northeastern Minnesota. By F. Leverett and F. W. Sardeson. 1916.

The following bulletins have been completed and will be issued as soon as funds are available for their publication:

Surface formations and agricultural conditions of southern Minnesota.

The peat deposits of Minnesota.

The building and ornamental stones of Minnesota.

Clays and shales of Minnesota (final report).

Accompanying *Bulletin 12* and *Bulletin 13* are maps of the northwestern and northeastern quarters of Minnesota, showing the surface formations with particular attention to the soils. Arrangements have been made with the Topographic Engraving Company of Washington, who printed these maps for the Survey, to supply them in quantities at low cost to county organizations, immigration bureaus, or others interested in furthering the settlement of the state. The cost of the field work and of making the plates has already been met by the Survey. It is hoped that more extensive use will be made of the privilege of purchasing these maps at cost of printing.

Respectfully submitted,

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 during the year 1915-16:

Field work.—The field seasons of 1915 and 1916 were spent in further study of the origin and formation of the swamps and bogs of the state. During 1915 the intensive studies of the preceding year were extended through Beltrami, Koochiching, Cass, Hubbard, and Crow Wing counties. In 1916 a special study was made of the succession of plant populations in swamps and bogs, with especial reference to the permanence of grassland and woodland. A preliminary account of this has been published in part 4, volume 4 of *Minnesota Botanical Studies,* and it is hoped to deal with this and other bog problems in detail in the proposed report on the swamps and bogs of the state.

Publications.—The publications of the past year consist of the 4th edition of the *Guide to Spring Flowers,* and part 4 of volume 4 of *Minnesota Botanical Studies.* There is a constant demand for new editions of several guides that are out of print, as well as for the publication of *Minnesota Plant Galls, Minnesota Grasses and Sedges,* and *Minnesota Swamps and Bogs.*

Respectfully submitted,

FREDERIC E. CLEMENTS, *State Botanist*

THE UNIVERSITY LIBRARY

To the President of the University:

SIR: In closing my tenth year of service as Librarian of the University it is perhaps fitting that I should call attention to the advance that has been made by the Library during that period. The progress of the University as a whole is conditioned by and determines the development of the library. Its growth is an index of the transformation of the institution during the decade.

During the five years ending with July 31, 1906, the average annual expenditure of the entire University for books, periodicals, and binding was $10,297. For the next three years Folwell Hall equipment funds were available and the average rose to $24,165.88. Increased funds were granted beginning with the biennium 1909-11 and the average expenditure for the last five years has been $40,203.49.

As a result of this policy, our library has in a few lines already become notable. The University is able to get and to keep men, who, had we less adequate library facilities, would go elsewhere.

We must, however, if we are to hold a place among institutions of the first rank, increase still further the sums available for the development of the library, not only in respect to acquisition but administratively. We must have expert service and more of it and the books must be so housed as to make them available for convenient use and to assure their preservation for future generations. We have had far too much experience with fire at this institution to permit us to be blind to the risk involved in our present installation.

During the past year, $40,076.16 has been expended on books, periodicals, and binding. Our accessions have been 23,418. During the same period, Columbia has added 29,500, Chicago 31,743, Illinois 30,303, Princeton 26,169, Wisconsin 10,386, Yale 57,000, California 28,218, and Harvard 46,731. In every case their present collections are much stronger than ours. If we are to compete with them, our library must be more nearly commensurate.

An analysis of our expenditures for the past year is as follows:

	Books	Periodicals	Binding	Totals
General Library	$22,824.55	$4,538.81	$3,674.77	$31,038.13
Law Library	3,802.92	126.57	737.20	4,666.69
Agricultural Library	1,114.74	937.77	725.37	2,777.88
Crookston	620.35			620.35
Morris	883.33			883.33
Miscellaneous	89.78			89.78

Conditions incident to the war have hampered us materially in securing much needed books and periodicals. During the early part of the year the German market was practically closed but in February the British Foreign Office agreed to issue to institutions and agents of in-

stitutions permits allowing the importation of books of German origin. Under this rule we secured three direct shipments and in addition a large number of books which came to us through our New York agent. A little later the agent's permit was revoked and since that time we have been unable to secure either books or periodicals. As a result, we were compelled to carry over into the next fiscal year very considerable balances which must be reserved to cover orders already issued.

The effect of the war on book prices has not been entirely as anticipated. Outside of books related more or less definitely to the war, the foreign book trade is almost entirely with American purchasers. The dealers who have been able to continue in business have thus far been successful in holding prices fairly near to the ante-bellum level. The favorable rate of foreign exchange has had, whenever we could take advantage of it, the effect of a considerable discount. It is futile to predict what will be the condition of the market at the close of the war, but there can be no doubt that the purchaser on the ground who is able to pay cash will be able to secure very favorable terms.

Serials.—The number of serials now on our subscription list is 1,270 and a constantly increasing number is received by exchange. Very naturally, we have been unable during the past year to extend the list of European institutions with which we have exchange relations but something has been done in other countries.

The list of serial sets available in the Twin Cities is ready for publication and it is to be hoped that it can be issued at an early date. It will comprise a list of all publications of this character in the Minneapolis Public Library, the Hennepin County Medical Library, the State Historical Society (in part), the Ramsey County Medical Society, the St. Paul Seminary, and the Mayo Clinic at Rochester, as well as those in the various libraries of the University.

Reading rooms.—The recorded use of the library, and it must constantly be kept in mind that this represents only a fraction of the total use, is the largest in its history.

As compared with the previous year, the record is as follows:

	Home use	Over-night use	Reading Room	Total
1914-15	20,070	14,950	120,217	155,237
1915-16	20,914	20,239	127,621	168,774

We were not able to open the new Undergraduate Reading Room until late in the year, but the period was long enough to demonstrate its great value. It enables us to segregate the required reading of the large undergraduate courses and to issue the books for reading room use without the necessity on the part of the student of consulting the catalog and making out a call slip. This has increased by a very appreciable amount the time which he may devote to study.

The opening of the new room has not very materially decreased the pressure on the facilities of the Reading Room on the second floor. The

number of seats in this room is 161 and in the adjoining Periodical Room 39. The lower Reading Room seats 167. We were filled to the point of saturation before and we still remain saturated. A moment's consideration will show that, with our four thousand students working on this campus, more than 367 ought to be able to work in the library at a given time.

Congested conditions at the service department of the loan desk are such as to render convenient and adequate service to the students impossible. With our constantly increasing number of students, there is a corresponding increase in the work to be done, not only in issuing and receiving books, but in the clerical work of keeping records. The number of assistants is quite insufficient properly to care for our clientele, but the present operating space is overcrowded and each new assistant, altho sorely needed, adds physical obstruction to expeditious service.

The catalog.—The accessions of the year, amounting in the central collection to over twenty thousand volumes, have so burdened our small cataloging staff that practically nothing has been done on that portion of the library as yet uncataloged. Some progress has been made on the Monod collection, but the major portion is untouched.

Nine years have already passed since we began this cataloging and of the books in the library when the work was initiated fully 10,000 remain uncataloged. The condition is as annoying as it is unbusinesslike and it is to be hoped that during the next biennium the catalog can be brought down to date.

The work accomplished by the department during the year is indicated below.

	Central catalog	Departmental catalogs
Titles cataloged	8,271	2,486
Volumes cataloged	13,115	4,703
Printed cards added	22,253	6,071
Typewritten cards added	9,366	2,111
Printed shelf list cards	3,581	735
Typewritten shelf cards	3,228	1,358
Volumes added	5,125	1,619
Total volumes recorded	185,423	

In addition to the above, author entry cards for 943 books in the Agricultural Library have been added to the central catalog. A total of 89,395 cards has been prepared and inserted in the various catalogs and shelf lists. This figure does not include the cards added to the agricultural catalog.

The department has also furnished to the Library of Congress, in accordance with an agreement for coöperative cataloging, copy for 195 titles and purchased from them during the year ending June 30, cards amounting in cost to $456.56.

Exchange and sale of publications.—During the past year the following publications have been distributed to our exchanges:

Studies in the Social Sciences, No. 6
Current Problems, Series Nos. 6, 7, 8
Studies in Language and Literature, Nos. 2, 3
State Mining Experiment Station Bulletin, No. 4
Bulletins of the Agricultural Experiment Station, Nos. 150 to 154
Doctors dissertations, ten items
Contributions from the Department of Anatomy, No. 3
President's Report, 1913-14

The library acts as agent for the sale of all University publications. Very little effort has been made to advertise them, but the sales during the year have amounted to $845.31. Sums received in this way are credited to the budget that bore the cost of publication.

Binding.—Our binding account is constantly increasing. As the library grows larger and as the subscription list expands the expense of binding must keep pace. Bindings are constantly wearing out and must be replaced at once or the books will in a short time be irreparably damaged. Volumes of periodicals must be bound as soon as they are completed as otherwise numbers will become torn or lost.

The materials used in binding have largely increased in price during the year and we have been obliged to accept a new scale of prices. Some grades of leather and of fabrics are practically unobtainable.

There have been bound and rebound during the year, 6,517 volumes at a total cost of $4,906.34, distributed according to material as follows:

Material	Number	Cost
Cloth, buckram, etc.	4,469	$3,257.55
Morocco	601	731.65
Cowhide, sheep, calf, etc.	817	853.24
Boards	630	63.90

Inter-library loans.—The system of inter-library loans enables us to secure for use on our campus practically any book existent in other American libraries. During the year we have borrowed from other institutions as follows:

California University	1
Chicago University	13
Columbia University	12
Cornell University	5
Harvard University	2
Illinois University	15
John Crerar Library	1
Johns Hopkins University	1
Kansas University	1
Library of Congress	19
Mayo Clinic Library	1
Surgeon General's Office	142
U. S. Department of Agriculture	71

Washington University (St. Louis)	3
Wisconsin University	16
Yale University	7

Remodeling the present building.—The legislature of 1915 appropriated for this purpose the sum of $10,000. Work was begun in the summer of that year but, by reason of delay in the execution of the contract for book stacks, the new reading room was not open until April, 1916. About two thirds of the space formerly occupied by the Chapel has been used as an additional reading room and the remaining third for the installation of a much needed addition to our book stacks. A hydraulic elevator connects this room with the old stack rooms. The so-called history laboratory has been incorporated in the new reading room and Room 220, thus vacated, divided into two seminary rooms for the Department of History. A new lighting and ventilating system has been installed in the upper Reading Room.

Benton collection of maps.—Through the courtesy of Mr. Andrew Arthur Benton, Law '95, the library has become the depository of a large part of his very valuable collection of maps. About 5,000 sheets have thus far been turned over to us and Mr. Benton proposes to make further additions. While the ownership of the collection has not passed to us, its value is no less great. Mr. Benton has been far-sighted enough to appreciate the necessity, within certain proper limitations, of unrestricted use and has not hampered us by the imposition of conditions that would make the collection less effective.

New building.—I can but repeat the recommendations that have formed a part of all my recent reports. The physical conditions surrounding the use of the library are such as to hamper very seriously the educational work of the University. A single visit to our Reading Room on a usually crowded day will suffice to convince the most skeptical of the necessity of change. The stacks recently installed will afford space for our accessions of the next three years only and further erections in this building seem impossible. The situation is a serious one and the University should at once face it and provide a remedy.

I most earnestly recommend that the coming Legislature be asked to appropriate a fund of $10,000 to be used by the Library Committee in studying the problem and in conjunction with the architect, in preparing plans. In this way and in this way only can we erect a satisfactory building.

Respectfully submitted,

J. T. GEROULD, *Librarian*

THE ACADEMIC FRATERNITIES

To the President of the University:

SIR: I herewith submit my report as President of the Interfraternity Council for the year ending July 31, 1916.

New fraternities admitted to the Council.—During the past year three local organizations were installed as chapters of National Academic Fraternities, and as such, Phi Kappa Sigma, Sigma Phi Epsilon, and Alpha Sigma Phi, were admitted to the Council, bringing the membership up to twenty-three.

Sanitary survey of the fraternity houses made.—During the spring of 1916, a very complete sanitary survey of all fraternity houses was made under the direction of Dr. H. M. Bracken, Executive Officer of the State Board of Health. In a few cases, minor suggestions were made, but as a whole the fraternities were found to be well housed.

Scholarship.—The following table compiled by Assistant Dean Nicholson shows the relative ranking of the fraternities for the year 1915-16, and for comparison the standing of the fraternities for 1914-15 is included:

	1915-16	1914-15
Alpha Sigma Phi	1.35	.....
Acacia	1.29	1.42
Delta Upsilon	1.24	1.26
Sigma Phi Epsilon	1.23	.....
Beta Theta Pi	1.206	1.197
Phi Kappa Sigma	1.168	.....
Alpha Delta Phi	1.13	1.18
Delta Chi	1.037	.907
Kappa Sigma	1.03	1.19
Delta Kappa Epsilon	1.008	.99
Zeta Psi	.954	.93
Sigma Alpha Epsilon	.948	1.07
Phi Delta Theta	.932	.97
Delta Tau Delta	.929	1.195
Phi Kappa Psi	.9079	.92
Alpha Tau Omega	.885	1.048
Chi Psi	.884	.947
Phi Gamma Delta	.831	1.05
Sigma Chi	.818	.903
Theta Delta Chi	.814	.913
Sigma Nu	.733	.96
Phi Sigma Kappa	.725	1.25
Psi Upsilon	.618	.905

Comparison of fraternity and non-fraternity:

Fraternity	.981
Non-Fraternity	.948

In the above table, the same marking basis was used both years, and I believe the slightly lower standing of all fraternities for 1915-16 is caused by a tightening up of requirements in the University.

Scholarship of pledgemen, first semester, 1915-16.—The following table was compiled by me in February, 1916. The first column gives the total number of pledgemen at the end of the first semester; the second column those who were eligible for initiation, i..e, those who had a grade of pass or higher in 75 per cent or more of the work for which they were registered (no man eligible unless carrying eleven or more hours work). The third column gives the number of men not eligible, and the last column the percentage of men not eligible:

Fraternity	Total pledged	Eligible	Not eligible	Percentage not eligible
Acacia	9	7	2	22.2
Alpha Delta Phi	13	12	1	7.7
Alpha Tau Omega	9	6	3	33.33
Beta Theta Pi	12	11	1	8.33
Chi Psi	8	5	3	37.5
Delta Chi	8	6	2	25.0
Delta Kappa Epsilon	13	7	6	46.1
Delta Tau Delta	12	5	7	58.3
Delta Upsilon	10	6	4	40.0
Kappa Sigma	13	9	4	30.8
Phi Delta Theta	15	9	6	40.0
Phi Gamma Delta	14	7	7	50.0
Phi Kappa Psi	10	6	4	40.0
Phi Kappa Sigma	6	2	4	66.67
Phi Sigma Kappa	10	6	4	40.0
Psi Upsilon	7	5	2	28.6
Sigma Alpha Epsilon	12	5	7	58.3
Sigma Chi	8	7	1	12.5
Sigma Nu	10	2	8	80.0
Theta Delta Chi	9	6	3	33.33
Zeta Psi	8	5	3	37.5
Total	216	134	82	38.0

Sigma Phi Epsilon and Alpha Sigma Phi do not appear in the above table, as they were not members of the Council at that time. This table shows that 38 per cent of all the pledgemen at the end of the first semester of 1915-16 were below passing grade in more than 25 per cent of their work. In order to determine whether this percentage was much higher than it ought to be, I have taken the entire freshman class of the College of Engineering and Architecture for the first semester 1915-16 and applied the same scholastic requirement, just as if each man were a fraternity pledgeman. With this I obtained the following:

Total number of freshmen, College of Engineering and Architecture	179
Not eligible	39
Percentage not eligible	21.8

According to this basis of comparison I believe the number of men ineligible at the end of the first semester is entirely too high and that this presents a very urgent problem for the fraternities to solve.

Respectfully submitted,

Will F. Holman, *President*

THE GENERAL ALUMNI ASSOCIATION

To the President of the University:

SIR: I submit herewith the report of the General Alumni Association for the year ending July 31, 1916.

Publications.—The *Weekly* has been issued regularly during the college year and a special number, devoted to a history of forensic contests from the beginning of the University, was published. The Secretary has also been engaged in the preparation of material for a Handbook of Alumni Work for the (National) Association of Alumni Secretaries. Shortly after the submission of the last previous report the Secretary was appointed chairman of a committee to undertake the preparation of such a handbook.

Endowment fund.—The endowment fund has been increased during the year to a total of $28,788.09.

The alumni directory issued by R. L. Polk & Company, in the preparation of which our association assisted by furnishing the information at its disposal, was put on the market only a few days ago. The Association assumed no obligation in the matter beyond furnishing what information it had and received no returns of any sort from its publication, except a small number of copies for its own office use.

The constitution of the Association has been revised by a special constitutional committee. The result is the submission of an amended constitution which is practically a new document. The principal changes included in the report of the committee are (1) the initiation of amendments by any fifty members, (2) the letter ballot, (3) the election of ten directors at large.

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 for the year ending July 31, 1916:

Entrance requirements.—The Committee on the Relation of the University to Other Institutions of Learning, after conference with the Committee of High-School Superintendents, recommended the elimination of specific studies in Group F (vocational and miscellaneous studies) and that hereafter "applicants for admission be required to present at least eleven units (twelve for Engineering) from the first five groups with restrictions as at present plus four additional units as certified to by the high school superintendent as necessary for graduation and of acceptable nature." This action was deemed preferable to a constant expansion of Group F upon the request of the schools offering subjects not heretofore included in the list. This recommendation, which was approved by the Senate, becomes effective in September, 1916. There is no reason to believe that it will have a marked effect upon the attendance.

Calendar for 1916-17.—So many objections were raised to the extended holiday interruptions of classes throughout the year that it was deemed advisable to shorten the Christmas recess four days, the Easter recess two days, and begin classes one week later in September, leaving the college year so far as it involves recitation days the same as heretofore.

Registration time limits.—On May 4 the Senate passed the following regulation: "To promote uniformity of practice throughout the University in the registration of students, the following directory regulation is adopted for the guidance of the Registrar and the Admission Committees of the several colleges:

"No student shall be allowed to register in the University after ten days from the beginning of the semester, excepting in those unusual cases wherein special and peculiar circumstances shall justify the appropriate committee of the college concerned in permitting registration at a later date."

The purpose is to have all students get an equal start and to reduce to a minimum the shifting of programs after classes have got fairly under way.

Transfer of students within the University.—The following recommendations of the special committee appointed to consider this matter were approved:

1. Any student whose work is found unsatisfactory at the end of the semester in any college shall be either (a) dropped, (b) transferred, or (c) put on probation.

2. "Dropped students" are those whom the college faculty will not allow to continue or recommend for transfer to another college.

3. "Transferred probationers" or "probation transfers" are those who on recommendation of the faculty under which they are working may be

received into another college. This action has the aim of placing the student where he is best fitted and may be taken in case of delinquent students under certain conditions.

4. "Probationers" are faithful but weak students who are warned that they will be dropped if their work does not improve within a definite time.

5. Delinquent students shall be recommended for transfer only if they are faithful in their efforts but appear to be more likely to succeed in some other work. If the two colleges concerned agree to the transfer, the students will be entered on probation.

Transfer of dropped students.—The agreement which existed between the colleges of the state and the Arts College has been rescinded inasmuch as the necessity for such agreement no longer exists.

Duplication in degrees.—The question as to what extent credits earned toward a given degree might be counted toward another degree being raised, the following regulation was adopted:

No candidate may receive a given degree until he has completed at least one full year of resident work which has not been counted in meeting the requirements of another and different degree.

Accredited schools and colleges.—Senate action as indicated has been taken with reference to the following institutions:

1. Preparatory Schools. The following schools have been placed on the accredited list during the past year: St. Mary's College, Winona (approved for one year).

2. Junior Colleges. Interest in the educational experiment of having freshman and sophomore college work offered in the newly organized collegiate departments of some of the larger high schools of the state is increasing. The following schools have announced their plans for this work: Cloquet, Rochester, Faribault, Hibbing, and Jackson. The freshman work of the first three schools has been inspected this year. Stanley College of Minneapolis, and College of St. Scholastica, Duluth, two private schools, have also had one year of so-called junior-college work approved.

3. Colleges. College of St. Catherine, St. Paul, recognized as an institution of full collegiate grade. College of St. Teresa, Winona, recognized for undergraduate work subject to certain conditions. Augsburg Seminary. Two years of college credit are recognized, and its graduates who are specially recommended in classical languages, Norwegian, and English may register provisionally in the Graduate School.

Changes in staff.—Miss Edna Walters, Statement Clerk, and Miss Florence Lewis, Record Clerk, resigned and Misses Ethel Robertson and Nellie Churchill have been appointed to fill the vacancies. Miss Elsa Krauch has been transferred from the Editorial Department to take charge of the printing work of the office, especially the Directory, Register, Faculty list, etc.

Advanced standing.—This work is still handled by the respective college committees or individuals and is decidedly lacking in unity. It is

most urgently requested that steps be taken to centralize this function in the Registrar's office so that prompt service may be rendered applicants and all cases be consistently treated. The number of students transferring to the University each year is steadily increasing and our facilities for handling the work involved should be augmented without delay. A competent assistant at approximately $1,200 to $1,500 a year to work under the Registrar's direction should be provided in the next budget.

Enrollment.—For Statistics of Enrollment, see pages 15 to 29.

Respectfully submitted,

E. B. PIERCE, *Registrar*

FINANCIAL REPORT

To the President of the University:

SIR: I submit herewith a report of the financial operations of the University of Minnesota covering the fiscal period ending July 31, 1916.

In accordance with your instructions, the tables given are but summaries of the year's business and additional tables and detailed statements are given in the Biennial Report as required by law.

Respectfully submitted,

G. H. HAYES, *Comptroller*

TABLE II

CLASSIFICATION OF EXPENDITURES BY COMMODITY

1911-1916

	1911-1912	1912-1913	1913-1914	1914-1915	1915-1916
Salaries	$814,851.89	$919,588.97	$1,082,349.67	$1,110,416.34	$1,207,016.64
Wages	142,329.88	151,527.93	221,239.57	266,771.21	311,798.00
Miscellaneous Labor	36,070.39	49,499.12	49,624.31	74,459.84	80,145.67
Postage	6,000.00	8,878.57	11,899.94	12,680.89	10,808.63
Stationery and Printing	21,748.72	27,018.30	23,915.05	27,781.47	48,274.60
Publications and Advertising	8,046.37	17,217.63	18,012.40	20,749.06	22,781.12
Freight and Express	6,315.56	10,958.34	9,142.64	9,981.78	10,859.78
Traveling Expenses	18,058.19	31,473.42	50,298.55	48,644.16	41,632.12
Telegraph and Telephone	5,200.55	6,047.91	6,710.52	7,985.07	7,796.07
Provisions	72,755.10	85,983.26	94,081.48	105,987.95	144,475.08
Supplies for Instruction	51,443.71	77,163.46	93,382.58	124,787.77	88,787.06
Seeds and Plants	1,660.79	4,244.32	2,637.00	2,515.16	3,250.48
Feeding Stuffs	18,626.56	19,351.29	27,096.30	34,802.55	34,454.37
Laundry	11,332.13	12,629.31	13,819.63	17,963.72	15,669.22
Miscellaneous Supplies	9,641.80	8,872.92	24,323.22	47,647.76	54,860.13
Gas	5,507.53	6,092.94	6,095.72	6,942.04	9,686.50
Electricity	7,609.03	7,495.72	9,330.13	10,833.54	14,543.39
Water and Ice	3,684.38	5,431.99	6,631.66	7,804.83	7,683.97
Fuel	72,728.55	78,886.37	90,499.40	88,781.36	106,118.26
Repairs	34,834.64	72,871.86	58,635.25	83,849.21	115,706.24
Rents and Assessments	17,196.93	3,296.27	2,396.74	2,562.19	3,633.78
Books	26,753.21	37,318.90	44,811.75	42,473.71	40,076.16
Apparatus, Instruments, and Glassware	20,952.82	64,666.12	74,299.56	54,652.67	47,620.22
Furniture and Furnishings	22,195.27	93,963.56	70,668.72	40,318.75	61,412.42
Tools, Implements and Machinery	19,686.03	18,915.61	36,301.86	37,297.77	31,227.00
Typewriters and Adding Machines	1,811.12	3,830.19	3,125.00	4,197.61	3,495.13
Book-Binding	3,430.00	3,700.54	3,753.45	4,487.07	5,166.04
Dining-Hall Equipment	2,250.00	3,362.93	2,024.02	1,806.48	2,887.45
Kitchen Utensils	1,540.72	1,955.62	2,491.42	1,605.86	1,485.25
Livestock	11,871.08	12,239.40	14,820.70	15,217.80	19,078.63
Land Purchases	.....	52,137.20	.....	6,300.00	2,500.00
New Construction	954,872.69	750,167.55	762,588.43	763,476.98	309,744.89
Interest on Certificates	10,250.00	2,925.00	66,462.50	.....	.....
Premiums	1,782.25	2,267.50	276.12	175.00	323.00
Sundry Trust Funds	.....	14,115.69	11,209.69	13,179.85	21,034.31
Book Store	14,112.14	10,808.12	13,555.15	12,263.61	15,404.97
Refunds of Fees and Deposits	20,633.96	26,658.71	34,940.03	43,157.55	45,710.47
Trolley	.....	.....	.....	.....	14,445.80
Total	$2,477,783.99	$2,703,562.54	$3,043,450.16	$3,154,558.61	$2,961,592.85

PUBLICATIONS OF THE FACULTIES, 1915-16

SCIENCE, LITERATURE, AND THE ARTS

ANIMAL BIOLOGY

JOHN BLACK JOHNSTON, Ph.D., Dean of the College and Professor of Comparative Neurology

The cell masses in the forebrain of the turtle, Cistudo Carolina. *Journal of Comparative Neurology* 25:393-468. 1915. 60 figures.

THOMAS SADLER ROBERTS, M.D., Professor of Pediatrics, Emeritus; Professor of Ornithology and Associate Director of the Zoological Survey and Museum

The history of a case of splenic anemia, including early splenectomy and autopsy two years later. *The Journal-Lancet* 35:439-47. 1915.

Migration and nesting record blank of birds of Hennepin County. Prepared for, and published by, The Audubon Club of the Woman's Club of Minneapolis.

The winter bird life of Minnesota. *Fins, Feathers, and Fur* 1:13. 1915.

The winter bird life of Minnesota. Geological and Natural History Survey of Minnesota, Zoological Division, *Occasional Papers* no. 1:1-20. 1916. Illus.

HAL DOWNEY, Ph.D., Associate Professor of Animal Biology

The cases of Gaucher's disease reported by Drs. Knox, Wahl, and Schmeisser (with F. S. Mandlebaum). *Johns Hopkins Hospital Bulletin* 27:109-113. 1916.

The histo-pathology and biology of Gaucher's disease (large-cell splenomegaly) (with F. S. Mandlebaum). *Folia Haematologica*, Archiv 20. 1916. About 100 pages.

Reviews and abstracts of all American haematological literature. *Folia Haematologica* 1915-16.

GEORGE DELWIN ALLEN, M.S., Instructor in Animal Biology

Reversibility of the reactions of Planaria Dorotocephala to a current of water. *Biological Bulletin* 29:111-129. 1915.

The determination of the bile salts in urine by means of the surface tension method. *Journal of Biological Chemistry* 22:505-524. 1915.

CHARLES EUGENE JOHNSON, Ph.D., Instructor in Comparative Anatomy of Vertebrates

A four-winged wild duck. *The Auk* 32:469-480. 1915.

ART

JOSEPH BRECK, B.A., Lecturer in History of Art

A Gothic hunting tapestry at Minneapolis. *Art in America* 3:223-226. 1915.

Various articles on new accessions. *Bulletin of the Minneapolis Institute of Arts.*

MARGARET TALBOT JACKSON, B.A., Lecturer in History of Art

Portrait of a girl by Velasquez. *Art in America* 4:119-120. 1916.

Advertising an art museum. *Proceedings of the American Association of Museums* 10:68-71. 1916.

ASTRONOMY

WILLIAM OTIS BEAL, M.S., Assistant Astronomer

Photographic positions of Comet f1913 (Delavan). *Astronomical Journal* 29:147. 1916.

BOTANY

CARL OTTO ROSENDAHL, Ph.D., Professor of Botany

Observations on Betula in Minnesota with special reference to some natural hybrids. *Minnesota Botanical Studies* 4:443-459. 1916.

Reputed Minnesota plants which probably do not occur in the state (with F. K. Butters). *Minnesota Botanical Studies* 4:461-473. 1916.

On the occurrence of Pinus Banksiana Lamb. in the driftless area of southeastern Minnesota (preliminary note with F. K. Butters). *Science* (new series) 43:29. 1916.

The distribution of Quercus alba L. in the state of Minnesota (preliminary note with F. K. Butters). *Science* (new series) 43:29. 1916.

HERBERT FLOYD BERGMAN, M.S., Assistant Professor of Botany

The development of climax formations in northern Minnesota (with H. Stallard). *Minnesota Botanical Studies* 4:333-378. 1916.

Comments on Malva rotundifolia and its allies. *Minnesota Botanical Studies* 4:437-442. 1916.

FREDERIC KING BUTTERS, B.S., B.A., Assistant Professor of Botany

Reputed Minnesota plants which probably do not occur in the state (with C. O. Rosendahl). *Minnesota Botanical Studies* 4:461-473. 1916.

NED L. HUFF, M.A., Assistant Professor of Botany

Copper sulphate treatment of St. Paul, Minnesota, water supply. *Journal of the American Water Works Association* 3:581-621. 1916.

Response of micro-organisms to copper sulphate treatment. *Minnesota Botanical Studies* 4:407-25. 1916.

WILLIAM SKINNER COOPER, Ph.D., Instructor in Plant Physiology and Ecology

Plant successions in the Mount Robson region, British Columbia. *Plant World* 19:211-238. 1916.

DONALD FOLSOM, M.A., Assistant

Studies in the morphology of Yucca Glauca. *Minnesota Botanical Studies* 4:427-435. 1916. 4 plates.

HARVEY STALLARD, Ph.B., Assistant

The development of climax formations in northern Minnesota (with H. F. Bergman). *Minnesota Botanical Studies* 4:333-378. 1916.

COMPARATIVE PHILOLOGY

FREDERICK KLAEBER, Ph.D., Professor of Comparative and English Philology, Head of the Department of Comparative Philology

Observations on the Finn episode. *Journal of English and Germanic Philology.* 14:544-49. 1915.

Americana. *Neuphilologische Blätter* 23:86-93. 1915.

Ein Blatt deutscher Dichtung. *Monatshefte für deutsche Sprache und Pädagogik* 16:303-06. 1915.

ECONOMICS

JOHN HENRY GRAY, Ph.D., Professor of Economics and Head of the Department of Economics

Expert (or opinion) testimony in rate valuation cases; a study in the administration of justice. *The Utilities Magazine* 1:192-204. 1916. Also printed in pamphlet form.

The Minneapolis survey and commercial education. National Society for the Promotion of Industrial Education, *Proceedings, Ninth Annual Meeting,* 98-109 (Minneapolis, 1916).

Discussion: Government regulation of business. First commercial and industrial congress, Madison, Wisconsin, February 14-18, 1916. *University of Wisconsin, Bulletin* no. 800, pp. 189-193. (General Series no. 597.)

How does industrial valuation differ from public-utility valuation? Presented at the annual meeting of the American Society of Mechanical Engineers, New York, December 7, 1916. Reprinted from the proceedings, 36 pages; also reprinted in full in *The Utilities Magazine* 2:26-40.

ROY GILLISPIE BLAKEY, Ph.D., Assistant Professor of Economics

Reviews of

Donald Earl Dunbar, The tin-plate industry. *Survey* 4:104. 1916.

JOHN FRANKLIN EBERSOLE, M.A., Assistant Professor of Economics

Editor of *Proceedings of Minnesota Academy of Social Sciences.* vol. 8. 1915. 203 pages.

Educational methods for promoting efficiency in bank administration. *Bulletin of Minneapolis Chapter of the American Institute of Banking* 1:1-4. Reprinted in *Commercial West* 29:20-21, *Chicago Banker* 41:1, and *North Dakota Banker* 4:1-2. 1916.

Summary of legislation affecting state banks. Reprinted in Part II of H. G. Moulton's *Principles of money and banking.* a series of selected materials 217-219, Chicago: University of Chicago Press. 1916.

The regulation of trust companies. Reprinted in *Principles of money and banking* 223.

Cattle loan banks. Reprinted in C. A. Phillips' *Readings in money and banking* 602-605. New York: Macmillan Company. 1916.

Amortization as a method for paying off mortgage debt. *Minnesota Farmers' Institute Annual* 29:74-81. 1916.

Federal Land Bank bonds as investments. *Minnesota Farmers' Institute Annual* 29:103-109. 1916.

Land as security for loans. *Minnesota Farmers' Institute Annual* 29:84-89. 1916.

Review of

H. Parker Willis, American banking, *Journal of Political Economy* 24:916-9. 1916.

LLOYD MORGAN CROSGRAVE, M.A., Instructor in Economics

Reviews of

Emory R. Johnson and collaborators, History of domestic and foreign commerce of the United States. *Indiana University Alumni Quarterly* 3:552-554. 1916.

Charles P. Steinmetz, America and the new epoch. *The Bellman* 21:810. 1916.

Frank J. Warne, The tide of immigration. *The Bellman* 21:826. 1916.

HARRY GORDON HAYES, Ph.D., Instructor in Economics

Problems and exercises in economics. New York: Henry Holt & Company. 1916. 80 pages.

ROBERT JAMES MCFALL, Ph.D., Instructor in Economics

Railway monopoly and rate regulation. *Columbia Studies in History, Economics, and Public Law*, vol. 49, no. 1. 124 pages.

ENGLISH

HARDIN CRAIG, Ph.D., Professor of English

The works of John Metham. London: The Early English Text Society. 1916. 146 pages.

ELMER EDGAR STOLL, Ph.D., Professor of English

Othello: an historical and comparative study. The University of Minnesota, *Studies in Language and Literature* no. 2. 1915. 71 pages.

JOSEPH WARREN BEACH, Ph.D., Assistant Professor of English

Urban colloquy (poem). *Atlantic Monthly* 116:486. 1915.

The dance in the steerage (poem). *Bellman* 19:635. 1915.

Nostalgia (poem). *Others: a Magazine of the New Verse* 2:132. 1916.

Lynch law (poem). *Bellman* 20:47. 1916.

OSCAR W. FIRKINS, M.A., Assistant Professor of English

Criticism. *Bibliotheca Sacra* 73:261-77. 1916.

New movement in poetry. *Nation* 101:458-61. 1915.

To my country (poem). *Yale Review* (new series) 5:267-68. 1916.

Reviews of

Poetry. *Nation* 100:271-72. 1915.

Poets of the day. *Nation* 101:228-29. 1915.

Recent poetry. *Nation* 102:254-55. 1916.

Rupert Brooke and other English poets. *Nation* 102:162-63. 1916.

Singers new and old. *Nation* 102:12-14. 1916.

Some recent verse. *Nation* 101:406-07. 1915.

With the poets. *Nation* 101:653-54. 1915.

GEOLOGY AND MINERALOGY

CLINTON RAYMOND STAUFFER, Ph.D., Associate Professor of Geology

Relative age of the Detroit River series. *Bulletin of the Geological Society of America* 27:72-77. 1916.

Divisions and correlations of the Dunkard series of Ohio. *Bulletin of the Geological Society of America* 27:86-88. 1916.

The relationships of the Olentangy shale and associated Devonian deposits of northern Ohio. *Journal of Geology* 24:476-487. 1916.

FRANK FITCH GROUT, M.S., Assistant Professor of Geology and Mineralogy

The clays of Minnesota. *The Journal of Geography* 14:185-187. 1916.

CHESSLEY JUSTIN POSEY, M.S., Assistant Professor of Geography

Geographic influences in the exploration and early development of Minnesota. ***Journal of Geography*** 14:214-217. 1916.

Editor in charge of the "Minnesota number" of the *Journal of Geography* 14: no. 6. 1916.

TERENCE THOMAS QUIRKE, Ph.D., Instructor in Geology

Geology of Espanola area. Memoir to accompany Map 180 A. Ottawa, Canada: Geological Survey of Canada. 1916.

Rock study applied to concrete. *Bulletin of the Affiliated Engineering Societies of Minnesota* 1:73-78. 1916.

THOMAS MONTEITH BRODERICK, M.S., Assistant in Geology

Some experiments bearing on the secondary enrichment of mercury deposits. *Economic Geology* 11:645-651. 1916.

GERMAN

CARL SCHLENKER, B.A., Professor of German, Chairman of the Department of German

Bulletin for teachers of German. The University of Minnesota, *Current Problems*, no. 8. 1916.

WALTER RALEIGH MYERS, Ph.D., Assistant Professor of German

Guerber's Maerchen und Erzaehlungen. Revised, and direct-method exercises added. Boston: D. C. Heath and Company. 1916. Exercises, 65 pages.

ALFRED EDMUND KOENIG, M.A., D.D., Instructor in German

Zur Kriegszeit. *Publications of the Germanistic Society of Minnesota*, 1916, no. 3. St. Paul: Ernest Mussgang. 24 pages.

HISTORY

GUY STANTON FORD, Ph.D., Professor of History, Head of the Department of History, and Dean of the Graduate School

Reviews of

Le Forestier, Les illumines de Bairère. *American Historical Review* 22:148-151. 1915.

T. Veblen, Germany and the industrial revolution. *American Historical Review* 21:801-803. 1916.

ALBERT BEEBE WHITE, Ph.D., Professor of History

Source problems in English history (with Wallace Notestein). New York: Harper and Brothers. 1915. 422 pages.

Review of

Charles Petit-Dutaillis, Studies and notes supplementary to Stubbs's constitutional history, II. *American Historical Review* 21:364-65. 1916.

WALLACE NOTESTEIN, Ph.D., Associate Professor of History

Source problems in English history (Harper's Parallel Source Problems) (with A. B. White). New York: Harper and Brothers. 1915. 422 pages.

AUGUST CHARLES KREY, Ph.D., Assistant Professor of History

Syllabus for medieval and modern history. Minneapolis: Perine Book Company. 1914. Revised edition. 65 pages.

Report of committee on syllabus for the history section. *Minnesota Educational Association.*

LATIN

JOSEPH BROWN PIKE, M.A., Professor of Latin, Head of the Department of Latin

Bulletin for teachers of Latin. Minneapolis, The University of Minnesota, *Current Problems* no. 7. 1915. 14 pages.

The study of classics in translation. *Nation* 102:252. 1916.

PHILOSOPHY AND PSYCHOLOGY

NORMAN WILDE, Ph.D., Professor of Philosophy and Psychology

The faith philosophy of Pierre Charron. *Philosophical Review* 24:614-630. 1915.

Scepticism and faith in the philosophy of Pascal. *Harvard Theological Review* 9:56-83. 1916.

DAVID FERDINAND SWENSON, B.S., Associate Professor of Philosophy

The anti-intellectualism of Kierkegaard. *Philosophical Review* 25:567-86. 1916.

The logical significance of the paradoxes of Zeno. *Journal of Philosophy* 13:515-25. 1916.

HERBERT WOODROW, Ph.D., Assistant Professor of Psychology

Reactions to the cessation of stimuli and their nervous mechanism. *Psychological Review* 22:423-452. 1915.

Outline as a condition of attention. *Journal of Experimental Psychology* 1:39-54. 1916.

Reviews of

The psychological researches of James McKeen Cattell. *Journal of Philosophy, Psychology, and Scientific Methods* 13:190-193. 1916.

JOSEPH PETERSON, Ph.D., Professorial Lecturer in Psychology

The origin of higher orders of combination tones. *Psychological Review* 22:512-518. 1915.

The completeness of response as an explanation principle in learning. *Psychological Review* 23:153-162. 1916.

Illusions of direction orientation. *Journal of Philosophy, Psychology, and Scientific Methods* 13:225-236. 1916.

Tone and noise perception in the white rat. *Journal of Animal Behavior* 6:327-329. 1916.

The nature and probable origin of binaural beats. *Psychological Review* 23:333-351. 1916.

The effect of attitude on immediate and delayed reproduction: a class experiment. *The Journal of Educational Psychology* 7:523-532. 1916.

Review of
Moore, Genetic aspects of consonance and dissonance. *The Journal of Philosophy, Psychology, and Scientific Methods* 12:694-698. 1915.

JOHN FREDERICK DASHIELL, Ph.D., Instructor in Psychology

Another word on "mental discipline." *Pedagogical Seminary* 23:123-26. 1916.
"Professionalism," what is it? *Journal of Education* 84:396-7. 1916.

JACOB ROBERT KANTOR, Ph.B., Instructor in Philosophy and Psychology

Reviews of
Religio doctoris: meditations upon life and thought. *International Journal of Ethics* 25:556-558. 1915.
G. P. Watkins, Welfare as an economic value. *International Journal of Ethics* 25:558-559. 1915.
C. E. Gehlke, Emile Durkheim's contributions to sociological theory. *International Journal of Ethics* 26:145-146. 1915.
J. F. Bruno, Rosmini's contribution to ethical philosophy. *International Journal of Ethics* 27:121. 1916.
G. W. Cunningham, A study in the philosophy of Bergson. *International Journal of Ethics* 27:121. 1916.

PHYSICS

ANTHONY ZELENY, Ph.D., Professor of Physics

The effect of temperature on the absorbed charge and on the capacity of some electric condensers. *Physical Review* (series 2) 6:478-89. 1915.
The dependence of progress in science on the development of instruments. *Science* 43:185-93. 1916.

ALOIS FRANCIS KOVARIK, Ph.D., Associate Professor of Physics

The magnetic spectra of the *Beta*-rays of radium DE and of radium and its products, determined by the statistical method. *Physical Review* (new series) 8:5. 1916.

LOUIS WILLIAMS MCKEEHAN, Ph.D., Assistant Professor of Physics

Some properties of mercury droplets important in electronic charge measurements. *Physical Review* (series 2) 8:142-48. 1916.
The magnetic spectra of the *Beta*-rays of radium DE and of radium and its products, determined by the statistical method (with A. F. Kovarik). *Physical Review* (series 2) 8:574-78. 1916.

PAUL ERNEST KLOPSTEG, M.A., Instructor in Physics

Note on the damping factor used in ballistic constants of moving-coil galvanometers. *Physical Review* (series 2) 7:543-44. 1916.
On the "current deflection" method for determining ballistic constants of moving-coil galvanometers, with a note on the non-uniformity of magnetic fields in such instruments. *Physical Review* (series 2) 7:633-39. 1916.
The correction for thermoelectric current to be applied to the throw of a ballistic moving-coil galvanometer. *Physical Review* (series 2) 7:640-45. 1916.

OTTO JULIUS ZOBEL, Ph.D., Instructor in Physics

A note on the spectrum of Roentgen rays. *Physical Review* (series 2) 7:580-582.

POLITICAL SCIENCE

WILLIAM A. SCHAPER, Ph.D., Professor of Political Science, Head of the Department of Political Science

The need of a constitutional convention in Minnesota. *Minnesota Municipalities* 1:6-13. 1916.

Review of

William Howard Taft, Our chief magistrate and his powers. *American Political Science Review* 10:778-781. 1916.

CEPHAS DANIEL ALLIN, M.A., LL.B., Associate Professor of Political Science

The British North American League, 1849. Paper read before the Ontario Historical Society. (Pamph.) 44 pages.

ROMANCE LANGUAGES

EVERETT WARD OLMSTED, Ph.D., Professor of Romance Languages and Head of Department

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