BIENNIAL REPORT

OF THE

REGENTS

OF THE

UNIVERSITY OF COLORADO

1906-1908.

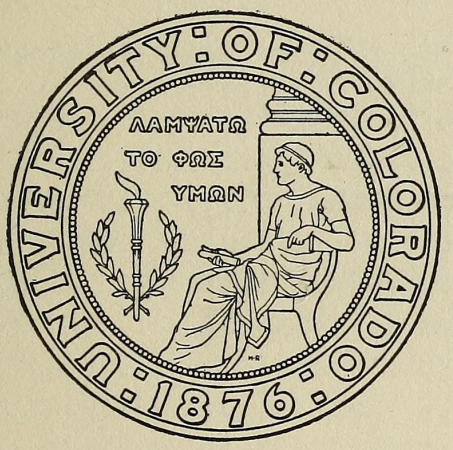
Sixteenth Biennial Report

OF THE

REGENTS

OF THE

UNIVERSITY OF COLORADO



BOULDER, COLORADO

October 1, 1908

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UNIVERSITY OF COLORADO.

SIXTEENTH BIENNIAL REPORT OF THE REGENTS, 1906-1908.

To the State Superintendent of Public Instruction, and the Seventeenth General Assembly:

The Sixteenth Biennial Report from October 1, 1906 to October 1, 1908, is herewith presented by the Regents.

INTRODUCTORY STATEMENT.

Perhaps the leading feature of this Report, apart from the customary record of events and financial statements, is the emphasis given the activities that are beyond the usual duties of undergraduate instruction. What the Graduate School is doing and aims at, the research work of various departments and its practical value to the State, and the need of further developing these interests, the books and articles written by members of the Faculty during the past two years are worthy of special attention. Next in importance is the establishment of the College of Education, a full account of which is found in its proper place. Emphasis is given to the reorganization of the General Faculty, for greater efficiency, the proposed revision of the College curriculum, increased facilities in the School of Medicine, etc., as tabulated below. The growth, new buildings, and needs appear as matters of course.

Reference is here made to the pages of the Report where some of the more important points are presented:

COLLEGES AND SCHOOLS OF THE UNIVERSITY.

The Colleges and Schools of the UNIVERSITY OF COLORADO are the following:

I. COLLEGE OF LIBERAL ARTS.
Courses leading to the degree B. A.

II. COLLEGE OF COMMERCE.
Course leading to the degree B. A. and special certificate.

III. COLLEGE OF EDUCATION.
Course leading to the degree B. A. and special certificate.

IV. GRADUATE SCHOOL.
Leading to the degrees M. A. and Ph. D.; also M. S., C. E., E. E., M. E.

V. COLLEGE OF ENGINEERING.
Civil Engineering, leading to the degree B. S. (C. E.).
Electrical Engineering, leading to the degree B. S. (E. E.).

Mechanical Engineering, leading to the degree B. S. (M. E.).

Chemical Engineering, leading to the degree B. S. (Ch. E.).

VI. School of Medicine.

Leading to the degree M. D.

VII. School of Law.

Leading to the degree LL. B.

VIII. Summer School.

ATTENDANCE.*

Years.	Univ. Students.	Summer School Students.
1891-2	66	..
1905-6	743	79
1906-7	840	98
1907-8	961	126
1908-9	1,025 (estimated)	129

*The attendance at the Preparatory School in 1891-2 was 103, in 1906-7 was 527. In September 1907 the Preparatory School, as a department of the University, was discontinued.

DEGREES CONFERRED.*

In 1907 and 1908 degrees were conferred as follows:

	1907	1908
College of Liberal Arts	53	77
Graduate School	9	14
College of Engineering	19	27
School of Medicine	12	11
School of Law	16	16
Honorary	..	1
	109	146

*The Preparatory School graduated 35 in June, 1907.

GRADUATES.*

The register of the graduates now shows the following figures:

College of Liberal Arts	558
Graduate School	105
College of Engineering	137
School of Medicine	173
School of Law	172
Honorary Degrees	18
	1,163

*Graduates of the Preparatory School, from the beginning until the School was discontinued, September 1907, and not included in the above summary, 587.

GRADUATE SCHOOL.

Higher degrees have been conferred upon 23 candidates in the past two years.

In the year 1907 the degree Master of Arts was conferred upon:

Name.	Subject of Thesis.
Clara Louise Alden,	"Physical Tests and Measurements of Children in the Boulder Public Schools."
Cora Bennett,	"The Relation of Insects to Plants."
Florence Wilder Coates,	"The Characters of Molière."
Ralph Dixon Crawford,	"Areal and Petrographical Geology of the Sugar Loaf District."
Leslie Ninde Cullom,	"The Dramatic Art of Ford, an Analysis and Appreciation of 'The Broken Heart.'"
Cora Curtis Long,	"The Women of Ibsen's Dramas."
Ethel Phoebe Waxham,	"The Dramatic Theory and Practice of Maurice Maeterlinck."

In 1908 the degree Master of Arts was conferred upon:

Emily Zene Craig,	"The Natural Drama."

Gertrude FitzRandolph Currens,	"The Dramatization of the Novel."
Jesse Wilson Currens,	"The American Drama."
John August Dopp,	"Influence of Repetition in Memory."
Durward Leslie Eaton,	"The Complex Roots of Algebraic Equations."
Frank Anthony Giacomini,	"On the Energy Generated in Lead or Zinc by Bombardment with Kathode Rays."
James Percy Grant,	"Japanese Education Before Meiji."
Roy Stuart McIntosh,	"Irrigation in Colorado and Its Influences on the Social and Industrial Development of the State."
Johnson Edward Naugle,	"On the Action of Some Aromatic Aldehydes upon Ortho-phenylene-diamine.
Sarah De Maupassant Plaisance,	"Les trois Unites chez Racine."
Lauran F. Smith,	"The Land Policy of Colorado."
Margaret Love Wheeler,	"The Satirical Element in the English Morality Plays."
Simon Horace Williams,	"The Scope and Value of Manual Training" (with original problems).

In 1907 the degree Civil Engineer was conferred upon:

Howard Carlton Ford,	"A Course in Railway Engineering."

In 1907 the degree Electrical Engineer was conferred upon:

David Rhys Jenkins,	"Electric Lighting."

In 1908 the degree Mechanical Engineer was conferred upon:

Harvey Ellison Murdock,	"Investigation of the Effect of Repetition of Stress on Steel."

In 1908 the honorary degree of Doctor of Divinity was conferred upon:

Harry Noble Wilson.

The Graduate School is the training place for special investigation in science, in philosophy, in literature, in history, in sociology. The scholarship of the University is judged by the quality of work done in preparing students for higher degrees. It is a matter of importance to every citizen of Colorado that this work be of a high standard of excellence, and that ample means be provided. The time has come when the Legislature should look into the needs of the Graduate School and provide for its support.

Some needs are obvious by a glance at the work of the departments, as may be shown by these two examples: (1) In the department of Economics ten graduate students have asked for work in four divisions as follows: one graduate from the University of Chicago, in an elementary class of undergraduates, two hours a week; a graduate in a more advanced class of undergraduates, three hours a week; four graduates in a class of undergraduates, two hours a week; seven graduates in a class primarily for graduates, meeting in seminar once a week. This last is a remarkable class, containing five men and two women; three of them are graduates of Eastern institutions, three are candidates for the degree Ph. D., studying in the Graduate School under Dr. Phillips in 1906-7, under Professor Bailey in 1907-8, and now under Professor King. This is a class which any university might be proud of. They are ready to do original work. They are taking all the department offers; and the department is offering all it can. One meeting a week for graduates is insufficient. This group has been attracted partly by the excellent work of the department and partly by the subject. If satisfactory graduate work is to be conducted in this field, a department of sociology should be established to cooperate. (2) In another department the applications for graduate instruction by students now in attendance are in six classes: a graduate of a Massachusetts college, five hours in a limited class of advanced undergraduates; a graduate in another class of upper classmen conducted by the professor, three hours; an instructor in the University in a reading course, with written specifications for each day and with conferences, five hours; another instructor in the University in a reading course under supervision with conferences, three hours; a student who was in the Graduate School last year, reading courses with conferences, three hours; six graduate students in a class primarily for graduates with five ad-

vanced undergraduates, daily exercise with the professor, five hours. Four of this last class were in the Graduate School last year; two have the Master's degree from this University; and three are reading for the degree Ph. D. The graduate work asked for by these six classes thus early in the semester amounts to 102 hours of credit for the year, besides the supervison of six theses. If such additional demands come to a professor already loaded with the usual amount of undergraduate classes and faculty responsibilties, what is to be done?

The care of the State is asked not only in providing additional instruction and equipment in several departments but also in furnishing those advantages and inducements which will put the Graduate School of this University on some equality with other graduate schools. An up-to-date graduate school must have a body—it may be a small body—of first class students to set a standard of work. Our departments of biology, zoology, and geology are well coordinated for graduate work; they have one of the most attractive locations in the world, but it is hard to keep a good graduate student; such students are sooner or later called away by superior inducements, not of field or instruction, but of money or position. If fostering care is needed for departments where the pre-requisites are simple and easily met by the average graduate, how much more attention is needed to build up a nucleus in departments like physics, and classics. A graduate student should have twelve to fourteen years in mathematics for good preparation in physics; few get it. The graduate students in physics are usually men working for degrees in engineering; in these later years every physics student who has power is offered an Eastern scholarship or called to some commercial enterprise. In classics the work is coordinated even better than in natural science; there is no other work that can be so perfectly done at this University, and it can be done no better anywhere. But a preparation of ten or eleven years in Latin and Greek is expected for admission to graduate courses in classics; fewer and fewer have this preparation; the work is straightforward, masterly; only strong students seek it; and strong students are wanted elsewhere. The University cannot afford to neglect the means taken by other institutions to foster higher classes in physics, classics and other departments of difficult preparation, and strenuous labor.

The loss to the University in other departments is real though less conspicuous. More are attracted to subjects of easy admission; but here, too, the Graduate School loses students to Harvard, Yale, Columbia, Chicago and Pennsylvania; the best student works up a good thesis and wins at the older institutions a living of five hundred to eight hundred dollars a year. The continual cutting off at the top results in great loss of power and prestige. These students of ability are needed here; some can teach; all can help in original investigation. The good professor gives all that he has and is to his students; and the good student gives back in the drudgery and irksome labor that underlies all new achievement; many a professor's reputation is buttressed by the labors of those who have worked under him.

Two things this University should stand for: high scholarship and original research; and these require a reorganization and better equipment of the Graduate School.

The degree of Master was first conferred in 1885. In 1892-3, the University announced that candidates would be received for the degree Doctor of Philosophy; the degree was first granted in 1895. There has been a serious question about the advisability of granting this degree, so much so that two secretaries in charge of the School have declared against it. The time for hesitation is now past; the State should decide whether it wants a Graduate School or not. There are eleven candidates now asking for instruction towards the degree Doctor of Philosophy. In the next three years the University is likely to grant twice as many of these degrees as in its whole history. What candidates shall say of the instruction received will make a very serious contribution to the reputation of the University. Shall they say that they could get no work in classes, or only once a week? that they were in classes planned for freshmen and sophomores? that they worked alone with little supervision? that teaching was scarce and equipment poor? And will the faculty vote degrees to students with one-quarter of the standard work because some hard pressed department has been able to offer only twenty hours of graduate work in four years? The answer to such questions is not to be found in general legislation, but in liberal provision on the part of the State and in constant vigilance in the administration of the School.

The work for the Master's degree presents problems, too.

Shall credit from an inferior institution be accepted? No one person has the acumen, the patience, the time to detect and the influence to withstand the quibbles and subterfuges of the unfortunate clamorers for degrees. Every application for a programme of work and for a higher degree should be invalid without the approval of a committee of the strongest and most conservative members of the faculty who are constantly acquainted with all affairs of the Graduate School.

The last Biennial Report of the Regents contains a recommendation for the organization of the Graduate School with a Dean and Executive Committee, the committee to be appointed by the President in agreement with the Dean. The Dean and Committee should make a thorough study of graduate schools, revise schedules of students, admit to examination and recommend such legislation as shall maintain an honorable standard.

The work of the Graduate School is to be judged by the long list of graduate students who have been helped to greater influence though not taking a degree, by the eminent names among its alumni, and by the esteem of other institutions. The honorable record achieved is due to the earnestness and self sacrifice of individual professors. Through the years, scholarly men, usually overworked and often poorly paid, have devoted to graduate students their evenings, their Saturdays. No man has received extra pay for such work or release from other duties. Nor has money been spent upon the School by the State beyond buying blanks and books of record. The standing of the School is a monument to the love of learning of men, many of whom have passed away; and in the years to come other men of culture will not withhold their help from those who deserve it. But it is necessary to consider the great value of a graduate school, to note the vast sums spent by other institutions on graduate schools, and to plan for similar liberal scholarships, fellowships, and professorships at the University of Colorado.

COLLEGE OF LIBERAL ARTS.

Some years ago a definite danger was felt that the general growth of the University would be more or less at the expense of the College of Liberal Arts. This fear has fortunately proved groundless, and last year (1907-8) this department registered 532

students in a total of 961. The indications are that the present year will show as favorable a statement.

In the College of Liberal Arts, however, perhaps more truly than anywhere else, numbers are of little moment. The real essentials are wise and definite aims, real standards of achievement, and above all lofty ideals of teaching reflected in a proper spirit of learning. Along these lines the College may feel well qualified to report genuine progress. The preparation of the incoming students grows better each year, which permits of better work in the University. The staff on the whole is equipped with sound scholarship and animated by elevating ideals. There is a spirit of work and movement, manifested principally in the work of instruction, but also by research and publications. During the last two years the members of the Faculty have put forth a number of significant articles covering a range from palæontology to current literary studies, and indicating a laudable activity in most departments. With reference to the practical outworking of aims in College education, as manifested in the requirements for graduation, it should be noted that a committee is working on a "group" plan to replace the present elective system. During the next biennium the College will probably adopt some intelligent form of the "group" idea, which is already in operation in the College of Commerce and College of Education. The underlying thought is to have a curriculum which shall facilitate the training and disciplining of the student's mind in general, while giving him substantial knowledge and potential mastery of some field of a scholarship, thus fitting him for the service of mankind. The introduction of this "group" system will provide a helpful mechanism for the outworking of our educational ideals. But it would be barren without a competent teaching staff, and every effort must be made to keep the Faculty at the highest point of efficiency.

It is worthy of note that a class in Hebrew has been formed this year to meet a considerable demand. Debating has been organized with a special instructor in the subject and proper emphasis will now be given to this interest. Under a separate caption is a report on prize debates, etc.

Faculty.

The following promotions have been made in the last two years: George M. Chadwick, to be Professor of Music, September, 1907; James F. Willard, Ph. D., to be Professor of History, September, 1907; Ralph D. Crawford, M. A., to be Assistant Professor of Geology, September 1908; Miss Ruby L. Carstens, M. A., to be Instructor in Mathematics, September, 1908; Joseph L. Kingsbury, B. A., to be instructor in History, September, 1908; Miss Margaret S. Carhart, M. A., to be Instructor in English, September, 1908.

The following new appointments have been made: Vivian A. C. Henmon, Ph. D., to be Professor of Psychology and Education, January, 1907; Oliver C. Lester, Ph. D., to be Professor of Physics, September, 1907; Frank E. Thompson, B. A., to be Professor of Education, September, 1907; Clyde L. King, M. A., to be Acting Professor of Economics, September, 1908; Arthur L. Tatum, M. S., to be Instructor in Chemistry, September, 1907; Henry A. Hartman, Ph. D., to be Instructor in Education, September, 1907; Samuel C. Black, M. A., D. D., to be Instructor in Hebrew, September, 1908; Mary K. Murphy, B. A., to be Instructor in German, September, 1908; Whitford H. Shelton, Ph. B., to be Instructor in Romance Languages, September, 1908; Wilfred W. Robbins, B. A., to be Instructor in Biology, September, 1908; Harry A. Curtis, B. S. (Ch. E.), to be Instructor in Chemistry, September, 1908; Adolph G. Pierrot, Ph. B., to be Instructor in English, September, 1908; William R. Brackett, B. A., to be Instructor in Physics, September, 1908; Carl L. Rahn, Ph. B., to be Instructor in Education, September, 1908; Junius Henderson, B. A., to be Curator of Museum, September, 1907.

Professor John B. Phillips, Ph. D., was given leave of absence for one-half year to supply at the University of Michigan, January, 1908, and one year to study in Europe, September, 1908.

The following former members of the Faculty have severed their connection with the University: Professor William Duane, Ph. D., to enter the Curie Laboratory, September, 1907; Professor Sanford Bell, M. A., January, 1907; Professor Joseph H. Bair, Ph. D., January, 1907; Gideon S. Dodds, M. A., Instructor in Biology; Clarence I. Lewis, B. A., Instructor in English.

Mr. Herbert T. J. Coleman, A. B., was Acting Professor of

Education between the resignation of Professor Bell and the appointment of Professor Thompson. He accepted a position in the University of Toronto, 1907.

Research Work in the College of Liberal Arts.

It is clear that many departments of the College in addition to regular work should be able to do valuable service to the State in various special lines, if the necessary equipment and teaching force could be provided. Something in research leading more directly toward practical results is being done, but much more should be undertaken. In Colorado the mixed nature of the population, the diverse and multiform aspects of production and industrial activity, the persistent recurrence of the "capital and labor" problem, the significance of transportation, all suggest that the State University should be so equipped as to enable it to make investigations and render expert, disinterested service along given lines. Taxation should be studied scientifically, railroad traffic and development should be viewed as something more fundamental than a financial question, and railroad commissions could use an expert available for consultation. The University upon request ought to be able to assist the General Assembly with reports as to previous legislation in other states or countries in any connection. The Chair of History should be equipped to investigate local history. The science departments could with advantage reach out to various industrial and economic interests as well as engage in scientific research in this rich new field. Here follow some of the lines of research for which the State should provide as soon as possible:

Economics and Sociology.

Legislation.
Taxation.
Transportation.
Industrial Problems.
Sociological Problems.

History.

Local History. [Some work has been undertaken].

Psychology and Education.

Many Educational Problems. [Such as "History of Education in Colorado," "The Training and Certification of Teachers," "Practical Educational Ideals," "Educational Values," "Interrelations of Elementary, Secondary, and Higher Education," "The Technique and Economy of Training."]

Physics.

Theory of Electricity. [Already undertaken.]

Constitution of Matter. [Already undertaken.]

Problems of Radio-activity.

Air Currents. [Local.]

Temperatures above Mountains. [Local.]

Problems in Electricity and Magnetism, Thermodynamics, Mechanics.

[For research in most of these subjects more facilities are needed.]

Botany.

Sanitary Science and School Hygiene. [Some work now done; more laboratory and library equipment needed.]

Economic Botany. [Much is now offered; much more could be done; lectures by practical men could be offered.]

Forestry. [An additional professor and a greenhouse would be needed.]

Climatology. [In connection with the Weather Bureau; relation to life and industries.]

Museum Research. [Various problems in Geology, Palæontology, Botany, and Geology; especially important in Colorado.]

Experimental Evolution. [Relation of altitude to the life and activities of plants and animals; problems of heredity and environment. A mountain laboratory would be needed.]

Zoology.

Zoology of Colorado.

Variation of Animals.

Geographical Distribution of Animals.

Entomology. [Scale insects; hymenoptera, diptera.]

Palæontology. [Fossil insects; fossil plants.]

[The above lines of research could be conducted now, with more financial support. The department of Zoology is continually

applied to by institutions and individuals to work up materials of certain groups which the professor has especially studied. In some cases (scale insects, etc.) this work has an important economic bearing. For want of time, and assistance in the more mechanical sides of the work, most of the requests have to be refused, although the proffered materials are often of great scientific interest, and a share of them would be given to the University. Although the results of much of the work would not be of especial interest to the people of Colorado, it must be remembered that it is customary for the higher institutions to work in their special lines for each other, and that we receive much help from universities and other institutions throughout the world, and should do our best to reciprocate. Heretofore Colorado has reaped continuous benefit from research work done elsewhere but has scarcely done her share of this class of work.]

Chemistry.

Methods of Mineral Analysis.
New Synthesis of Organic Compounds.
Preparation of New Organic Compounds.
New Methods of Electro-Chemical Analysis.
Analysis of Foods.
Physical, Chemical, and Electro-Chemical Problems.
Waters of Mineral Springs.
Industrial Chemistry. [Lectures by prominent technical men.]

[The Department of Chemistry is already doing much of the above work, is prepared to do most of it, but needs more money to carry on some of the lines of investigation.]

Geology.

Ceramics.
Cement. [Materials and geology of same; testing.]
Building Stones.
Quantitative Mineralogy, and Rock Analysis.
Petrography.
Palæontology.
Meteorology.
Work of State Geologist. [The Professor of Geology is now

State Geologist, but more money is needed for extension of the work.]

[To carry on all the above lines of research in Geology would require more equipment and more teachers.]

Archæology.

Last summer in connection with the American School of Archæology the University expended $500 for a field expedition in Southern Colorado. Much valuable material was collected, but is now stored in boxes until room in a new building can be provided sometime in the future.

Publications.

The following table will indicate the publications of the Faculty of the College of Liberal Arts during the past two years: James H. Baker, M. A., L.L. D., President of the University:

"American Problems" (Essays and Addresses). Longmans, Green & Co., New York, N. Y., 1907.

Ruby L. Carstens, M. A., Instructor in Mathematics:

"A Definition of Quaternions by Independent Postulates." University of Colorado Studies, Vol. III., No. 4.

George M. Chadwick, Professor of Music:

"Tendencies in Modern Musical Composition." University of Colorado Studies, Vol. III., No. 4.

"The Relation of the Composer to Musical Form." University of Colorado Studies, Vol. V., No. 1.

T. D. A. Cockerell, Professor of Systematic Zoology:

Professor Cockerell has published about 150 papers and notes during the past two years. Many of these relate to the fossils discovered at Florissant, Colorado, by the University expedition. These fossils include many unique and hitherto undescribed forms, and throw much light on the history of Colorado during Tertiary times. Among the principal articles are:

"The Bees of Florissant, Colorado." Bull. Amer. Mus. Nat. Hist.

"The Bees of New Mexico." Trans. Amer. Entomological Society.

"The Coleoptera of New Mexico" (with H. C. Fall). Trans. Amer. Entomological Society.

"A Scientific Comedy of Errors" (with F. B. R. Hellems). Popular Science Monthly.

"Some Old World Types of Insects in the Miocene of Colorado." Science, Oct. 4, 1906.

"Fossil Insects from Florissant, Colorado." Bull. Amer. Mus. Nat. Hist.

"The Fossil Flora of Florissant, Colorado." Bull. Amer. Mus. Nat. Hist.

"Biology and Human Progress." Atlantic Monthly.

"Description of Tertiary Plants." Amer. Jour. of Science.

"Florissant: a Miocene Pompeii." Popular Science Monthly.

Other articles have appeared in the following journals: Psyche, Entomological News, Nature, Nautilus, The Dial, University of Colorado Studies, Muhlenbergia, Torreya Botanical Gazette, Annals and Magazines of Natural History, American Naturalist, etc.

342 new species (the majority insects, but including many plants, mostly fossil, some mollusca, etc.) have been described.

Gideon S. Dodds, M. A., Instructor in Biology:

"On the Brain of One of the Salamanders (*Plethedon Glutinosus*)." University of Colorado Studies, Vol. IV., No. 2.

"A list of the Entomostraca of Colorado." University of Colorado Studies, Vol. V., No. 4.

John B. Ekeley, Ph. D., Professor of Chemistry:

"Ueber ein zweites Dihydrochinoxalin." Berichte der Deutschen Chemischen Gesellschaft.

"A New and Short Method for the Determination of Tungsten in Tungsten Ores." Western Chemist and Metallurgist.

"The Valuation of Commercial Potassium Chlorate." Western Chemist and Metallurgist.

Saul Epsteen, Ph. D., Assistant Professor of Engineering Mathematics:

"The Mathematics of Life Insurance." University of Colorado Studies, Vol. IV., No. 1.

"On an Algebra in Three Units." University of Colorado Studies, Vol. IV., No. 3.

"A Theorem on Differential Functions." University of Colorado Studies, Vol. IV., No. 3.

"Convergence of Series." School Science and Mathematics, December, 1907. See also College of Engineering, page 31.

Fred B. R. Hellems, Ph. D., Dean of the College of Liberal Arts, Professor of Latin:

"The Epigram and Its Greatest Master, Martial." Poet Lore, Vol. XVI., No. 4.

"Lucretius and Haeckel Before the Riddles of the Universe." University of Colorado Studies, Vol. III., No. 3 and Vol. III., No. 4.

"A New Master of English Prose and Some Theories of Value." The Dial, Vol. XLI., p. 226 seq.

"Three Decades of the American University." The Dial, Vol. XL., p. 289 seq.

"The Greek World Under Roman Sway." The Dial, Vol. XLI., p. 110 seq.

"Greece under the Franks." The Dial, Vol. XLII., p. 306 seq.

"The Symbolist Movement in Literature." The Dial, Vol. XLIV., p. 374 seq.

Various other articles and reviews (perhaps twenty) in The Classical Journal, The Dial, The School Review, etc.

Junius Henderson, A. B., Curator of the Museum:

"The Tertiary Lake Basin of Florissant, Colorado." University of Colorado Studies, Vol. III., No. 3.

"The Mollusca of Colorado." University of Colorado Studies, Vol. IV., No. 2. Part II. in Vol. IV., No. 3.

"An Early Colorado Naturalist—Dennis Gale." University of Colorado Studies, Vol. V., No. 1.

"Annotated List of Natural History Works Especially Useful to Rocky Mountain Students." University of Colorado Studies, Vol. V., No. 3.

"The Sandstone of Fossil Ridge in Northern Colorado and Its Fauna." University of Colorado Studies, Vol. V., No. 3.

Vivian A. C. Henmon, Ph. D., Professor of Psychology and Education:

"Some Psychological Principles Underlying Primary Education." Rocky Mountain Educator, Vol. XIII., No. 11.

"Recent Tendencies in the Study of Educational Problems." Rocky Mountain Educator.

"Review of Seashore's 'Elementary Experiments in Psychology.'" Journal of Philosophy, Psychology and Scientific Methods.

Clyde L. King, M. A., Acting Professor of Economics and Sociology:

"Organization of the Military Forces of North Carolina During the American Revolution." North Carolina Booklet, 1908.

Oliver C. Lester, Ph. D., Professor of Physics:

"Text Book in The Integrals of Mechanics." Ginn & Co., Boston. (In press).

Melanchthon F. Libby, Ph. D., Professor of Philosophy:

"Three Lectures on the Education of the Sentiments." Rocky Mountain Educator, Vol. XIV., Nos. 7, 8, and 9.

"Shakespeare and Psychognosis" (4 Essays.) University of Colorado Studies, Vol. III., No. 4, Vol. IV., No. 1, Vol. IV., No. 4, Vol. V,, No. 4.

"The Alleged Growth of Altruism in the Civilized Period." University of Colorado Studies, Vol. V., No. 4.

George Norlin, Ph. D., Professor of Greek:

"The Doctrines of the Orphic Mysteries, with Special Reference to the Words of Anchises in Vergil's Sixth Aeneid." Classical Journal, Vol. III., No. 3.

"Review of Professor Seymour's Life in the Homeric Age." Classical Philology, Vol. III, No. 4.

John Burton Phillips, Ph. D., Professor of Economics and Sociology, Secretary of the College of Commerce:

"Social and Industrial Effects of Railroad Rate-Making." University of Colorado Studies, Vol. III., No. 4.

"Significance of the Banking Situation in Colorado." University of Colorado Studies, Vol. IV., No. 2.

"The Increase of Divorce." University of Colorado Studies, Vol. IV., No. 4.

"Scientific Assistance in Law-Making." University of Colorado Studies, Vol. V., No. 1.

"The Habitation Tax." University of Colorado Studies, Vol. V., No. 2. Read at the National Conference on State and Local Taxation, Columbus, Ohio, November, 1907.

"A Colorado Railroad Pool." University of Colorado Studies, Vol. V., No. 3.

"The Population of Colorado." University of Colorado Studies, Vol. V., No. 4.

Francis Ramaley, Ph. D., Professor of Biology:

"Silva of Colorado" (University of Colorado Studies): I. Trees of the Pine Family in Colorado, Vol. IV., No. 2; II. Poplars, Aspens and Cottonwoods, Vol. IV., No. 3; III. Woody Plants of Boulder County, Vol. V., No. 1.

"Botany of North-Eastern Larimer County, Colorado." University of Colorado Studies, Vol. V., No. 2.

"Color Variations in some Colorado Flowers." Plant World, XI, 1908.

"Plant Zones in the Rocky Mountains of Colorado." Science, N. S. XXVI., 1907.

"The Botanical Gardens of Ceylon." Popular Science Monthly, LXXIII, 1908.

George C. Taylor, Ph. D., Professor of English:

"The English Planctus Mariae." Modern Philology, April, 1907.

"Relations of the English Corpus Christi Play to the Middle English Religious Lyric." Modern Philology, July, 1907.

Frank E. Thompson, B. A., Secretary of the College of Education, Professor of Education:

"Formal Discipline and Waste in Education." Rocky Mountain Educator, December 1907 and March, 1908.

"Teaching Aims." Colorado School Journal, October, 1908.

"Foreword to Manual of Agriculture." Ginn & Co., 1908.

Edward Tuthill, M. A., Assistant in History:

"The Appeal of Alexius for Aid in 1095." University of Colorado Studies, Vol. IV, No. 3.

James F. Willard, Ph. D., Professor of History:

"The English Church and the Lay Taxes of the Fourteenth Century." University of Colorado Studies, Vol. IV., No. 4.

"The Scottish Raids and the Fourteenth Century Taxation of Northern England." University of Colorado Studies, Vol. V., No. 4.

The Summer School.

The Summer School has now been tried for five years, and has met the purposes for which it was established. The Faculty has been strengthened each year, until at the last session it was all that could be desired. Not only are strong men available from the regular staff, but the attractiveness of a Colorado summer enables us to procure eminent men from other institutions for incredibly small expenditure. The work has been strictly maintained on a high standard, worthy of the University's best traditions. The attendance has increased to one hundred and twenty nine; but, while the growth is creditable, it is not all that could be desired, nor all that the intrinsic merits of the School added to our exceptionally favorable location would lead us to expect. It would seem that the time has come for a decided addition to the number of courses offered, if the Summer School is to meet the requirements of its constituency. There is every reason for believing that in the near future the numbers in attendance will grow much more rapidly than in the past; and every effort should be made to meet this increasing demand. The first enlargement should be in the nature of advanced courses, wherein the teachers of our high schools could find additional opportunities to improve their equipment as specialists.

College of Commerce and College of Education.

These Colleges are essentially organizations within the College of Liberal Arts, arranged on an intelligent group system to meet two growing demands. The former is intended to equip students as business specialists, so to speak, who may become leaders in the economic life of the Commonwealth. The latter is intended primarily to insure a supply of really well equipped teachers for the secondary schools and to afford an opportunity

for advanced students to participate in pedagogical research. Special reports of both Colleges will be found elsewhere.

COLLEGE OF COMMERCE.

In the summer of 1906 the Regents founded the College of Commerce as a division of the College of Liberal Arts for those who desire a higher university education combined with a preparation for practical business life. It is interesting to note that the University of Colorado was one of the leaders in this movement in the United States, and that other large universities, notably Harvard and Northwestern, have now organized similar courses.

It is important to distinguish carefully between the College of Commerce and the ordinary business college. It is now a well recognized principle that the man who is to be a leader in business, and who is to manage large enterprises, involving great sums of money, must know something of law, economics, the markets of the world, and the location of available power and labor. He must also understand methods of capitalization, the problems of consolidation, and he must have a thorough knowledge of accounting and special training in finance. The course of study in the College of Commerce is thus even more difficult than the ordinary university course, and graduates therefore receive a special Certificate in Commerce in addition to the regular university diploma and the B. A. degree.

The Committee which was recently appointed to revise the curriculum will recommend that the work be reorganized on a new basis. Instead of a single fixed course, the student is to be allowed to select any one of the following six lines of study: Banking, Manufactures, Transportation, Trade, Journalism, Consular Service. All of these courses have some elements in common; for instance, in each one the student is required to study some law (the Law of Sales, Contracts, Bills and Notes, Corporations, etc.); Accounting; one foreign language; one science; and English Composition. Aside from this, each course has been worked out with special reference to the particular needs of those who intend to follow that branch for their life work.

In the absence of the Secretary, Professor John B. Phillips, Professor William L. Bailey was appointed Acting Secretary for

the second semester of the year 1907-1908, and Dr. S. Epsteen for the year 1908-1909.

The changes in the Faculty of this College are enumerated in the Report of the Dean of the College of Liberal Arts.

It is intended, at an early date, to appoint a number of Lecturers in the College of Commerce to offer practical courses in the lines of Industry and Commerce in which they are proficient.

The significance of this department of the University is gradually becoming known and there is a substantial enrollment of incoming students this year, 1908-1909.

COLLEGE OF EDUCATION.

A College of Education, to be a division of the College of Liberal Arts, was authorized by the Board of Regents in January, 1908. The report of the committee on a course of study was adopted in April, and the College was regularly opened for work in September. This College was authorized and the course of study was adopted in view of a very definite demand for advanced professional training for teachers and the more serious study of educational problems. Such institutions have been established and are being established in leading universities all over the country. The consensus of educational opinion now is that the training of the educator for all grades of instruction or of supervision from the elementary school up shall not be inferior in system and comprehensiveness to that of persons in other professions. More specifically this consensus of opinion amounts to a demand that many of the teachers in the elementary schools, *all the teachers in the high schools*, and all persons engaged in supervision, shall have as a minimum of scholarship the equivalent of the B. A. degree, at least a speaking acquaintance with philosophy and psychology, and an intimate knowledge of educational matters. The demand is for professional schools of collegiate rank which shall afford to students who enter the educational field an opportunity for superior professional training, both practical and theoretical, for administrative, supervisory and teaching positions.

Inasmuch as teaching, in the professional sense, is service in an exceedingly complex field, the training required cannot be adequately given except in institutions of at least collegiate

grade, nor in less time than that required for a college course. It is therefore peculiarly fitting that a College of Education should be organized in connection with, and largely out of, the facilities of the College of Liberal Arts in the University. Here are found the most complete equipment for securing the requisite scholarship, the best atmosphere for the development of scientific power and professional spirit, as well as the most highly selected students with whom to work. College atmosphere gives a breadth of culture and has in it a suggestion of educational leadership which is to be found nowhere else. For the high-school teacher in particular a college training is demanded in practically all sections, as was shown by the Report of the Committee of Fifteen, as early as 1895, later by the Standards for Accrediting of the North Central and other Associations of Colleges and Secondary Schools, and recently in an emphatic way in the joint recommendations of the Committee of Seventeen on the Professional Preparation of High-School Teachers. In addition to this minimum requirement of academic preparation the same associations are insisting upon both general and special training of a standard given only in university departments. From the standpoint of the University, the training of teachers is one of its most important means of service. Regarding the essential services of a university to the commonwealth as the scientific investigation of the people's problems, the training of certain professional persons and of leaders in the various lines of activity, and the setting of culture standards, it at once becomes apparent that there is no more logical employment for state university endeavor than this training of expert educators. Teaching is one of the community's most important activities, and a rapidly growing body, both lay and professional, is expecting the same effectiveness in results achieved as is common in other fields. The university can make no mistake in training these leaders, and the student can make no mistake in taking such training.

The College of Education is designed to do the work indicated; it is a device of organization and administration in the College of Liberal Arts to secure to the prospective teacher studies along pertinent lines and in right proportions and sequence. Its students are assisted and directed in the choice and prosecution of their work from the time of matriculation

until graduation. They do not sacrifice anything of the culture of the Liberal Arts course, but through all the four years are growing professionally in efficiency and spirit. The curriculum is designed to furnish to the prospective teacher and leader in educational thought who would be thoroughly equipped for his work:

1. Courses calculated to give the broader acquaintance with knowledge and the culture rightly expected of the college graduate.

2. Courses in the subjects he expects to teach, of such character and so organized in sequence that when graduated he will be in some measure an authority in his branch.

3. Courses that will give:

   (a) Knowledge of the constitution and needs of society.

   (b) Knowledge of child and adult natures and their possibilities for modification.

   (c) Knowledge of the educational values of the various school subjects.

   (d) Knowledge, both general and specific, of the arts of instruction—this knowledge to come in large measure from actual practice in teaching.

   (e) Knowledge of educational history and its significance, for both the present and the future.

The course of study covers a period of four years, 120 hours of credit being required for graduation. Graduates receive the degree of Bachelor of Arts and a Bachelor's Diploma in Education, which latter is to be a certificate of proficiency in education and a guarantee of efficiency in teaching. The requirements for graduation are as follows:

1. Prescribed subjects, 20 hours.
   English .....10 hours
   Classical Languages, Science or Mathematics...10 hours
2. Group Electives.
   Subjects the student expects to teach.....50 hours
3. Professional Subjects.....30 hours

The professional training must include the following:

   (a) Psychology .....6 hours
   (b) History of Education.....6 hours

(c) Science and Principles of Education.....3 hours
(d) Elementary Schools or Secondary Schools..3 hours
(e) Practice Teaching and Special Method.....6 hours
(f) Elective courses amounting to six hours in one or more of the following: Philosophy, Sociology, Phychology, Education.....6 hours

4. Free electives .....20 hours

For the doing of the work of this College the entire facilities of the College of Liberal Arts can be brought into play and the public schools of Boulder are largely laid under tribute. The question of practice teaching, the vexing problem of all training institutions, has been solved quite satisfactorily by a very simple device, namely, in the selection from the larger classes in the public schools of those pupils whose personality is such as to bring into the foreground the educational problems that confront the teacher. Each of these pupils is to some extent a subject for special study and treatment; hence the novice teacher's attention is at once forced where it properly belongs, upon the problem of how children learn rather than upon how teachers teach. These pupils, grouped into classes, are placed in charge of the student teachers under the immediate supervision of the regular class teacher, the school principal and a member of the faculty of the College of Education.

Many students have already entered the courses prescribed in the College of Education.

COLLEGE OF ENGINEERING.

The growth and development of the College of Engineering during the past two years have been very satisfactory. The number of students increased from 176 in 1905-06 to a registration of 271 in 1907-08. Four instructors have been added to the faculty and important additions have been made to the laboratories. The new Engineering Shops have materially increased the facilities for instruction.

The only change of importance in the requirements for graduation has been to substitute six hours foreign language and four hours English for the ten hours of foreign language formerly required.

The Journal of Engineering, published by the associated Engineering Societies, is a very creditable publication. Graduates of the College of Engineering have been placed in good positions and the credit and reputation of the University have been increased. The establishment of a timber-testing station by the U. S. Department of Agriculture, Department of Forestry, has added to the facilities for instruction.

Buildings.

The new heating, lighting and power plant should be completed at the earliest possible date and the old plant should be removed from the Engineering Building. This will take the dirt away from the class and drawing-rooms and laboratories, and will give some very much needed room to the electrical and mechanical engineering laboratories.

The installation of a new Engineering Research Laboratory will require additional space. This can be obtained by adding to the present Engineering Shops. The Engineering Building is now crowded and the increasing number of students will demand additional room at an early date.

Instructional Force.

The following table shows the date of appointment and official position of the members of the instructional force, exclusive of assistants, of the College of Engineering:

Civil Engineering Department.

Milo S. Ketchum, C. E. (Illinois) Professor.....Sept. 1904
Dean .....Sept. 1905
Alfred P. Poorman, B.S. (C.E.) (Illinois) Instructor...Sept. 1907
Clement C. Williams, B.S. (C.E.) (Illinois) Instructor..Sept. 1907

Electrical Engineering Department.

Herbert S. Evans, E. E. (Nebraska) Professor.....Sept. 1905
David R. Jenkins, E. E. (Colorado) Instructor.....Sept. 1905

Mechanical Engineering Department.

John A. Hunter, M. E. (Pa. State) Professor.....Sept. 1904
Axel E. Berggren, B.S. (M.E.) (Iowa State) Instructor.Sept. 1908
William Black, Jr., B. S. (M. E.) (Illinois) Instructor..Sept. 1908
George L. Sullivan, B. S. (M. E.) (Nebraska) Instructor.Sept. 1908

General Engineering Drawing.

Jacob H. Wallace, M. E. (Missouri) Instructor.....Sept. 1905
Assistant Professor.Sept. 1908

Engineering Mathematics.

Saul Epsteen, Ph. D. (Zurich) Instructor.....Sept. 1905
Assistant Professor.....Sept. 1906
James S. Mikesh, A. B. (Minnesota) Instructor.....Sept. 1908

Howard C. Ford, C. E. (Colorado) Instructor in Civil Engineering, resigned in June, 1907, to accept the position of Assistant Professor of Irrigation Engineering and Surveying in Iowa State College. George R. Moore, Instructor in Shop Work, and H. Gerald Venneman, B. S. (M. E.) (Colorado) Instructor in Mechanical Engineering, resigned their positions in June, 1908, the one to accept professional employment, the other for another position in the University.

Civil Engineering Department.

The instruction in this department has been strengthened by the addition of another instructor and by the increase in the equipment. A course in Bacteriology has been added in the junior year, thus making it possible to put the work in Sanitary and Water Supply Engineering on a better basis. A course in Reinforced Concrete Construction has been added to the work of the senior year. The increased equipment in the Applied Mechanics Laboratory materially improves the opportunity for instruction in the department.

Electrical Engineering Department.

The Electrical Engineering Department has made excellent progress. Several important additions have been made to the equipment and the efficiency of the instruction has been improved. The department should be provided with the necessary apparatus for making commercial tests and for standardizing electrical instruments.

Mechanical Engineering Department.

The erection of the Shops Building, the added room and equipment for mechanical engineering laboratories, and the increase of instructors places the department of Mechanical

Engineering in a much better position than before and hence its work should be much improved.

Chemical Engineering Department.

The course in Chemical Engineering has been changed so that students in this department are now given the same instruction in Electrical Engineering as is given to the Mechanical Engineering students. Quite a number of students have registered in Chemical Engineering that desire to take a course in Industrial Chemistry. These students have in a number of cases transferred to the College of Liberal Arts in order that they might take more work in Chemistry than was offered in their course. A course in Industrial Chemistry should be offered either in the College of Engineering or in the College of Liberal Arts.

General Engineering Drawing.

The work in this department has made very satisfactory progress. The freshman drawing room in the Engineering Shops is one of the best in the country, the lighting being almost perfect. The instruction given in Mechanical Drawing and Descriptive Geometry is excellent. A course in Free-hand Drawing has been added to the work in this department.

Engineering Mathematics.

The Department of Engineering Mathematics is now in excellent condition, the teaching staff having been materially strengthened this year by the appointment of an additional full instructor. Only a small percentage of students fail to obtain grades in Mathematics.

Engineering Language.

With the time available it was found impossible to give satisfactory courses in Rhetoric. The language work of the freshman year was therefore changed so that each student now takes six hours work in a foreign language and four hours work in Rhetoric. The courses in foreign languages and Rhetoric are especially arranged for engineering students. This change promises to give most excellent results.

Publications.

The following books and papers have been written by the members of the Faculty of the College of Engineering during the past two years:

Books.

Dean Milo S. Ketchum:

"The Design of Walls, Bins and Grain Elevators." Published by Engineering News Publishing Co., 1907.

"The Design of Highway Bridges." Published by Engineering News Publishing Co., 1908.

Articles.

"The Toxaway Dam." University of Colorado Journal of Engineering, No. 3, 1907.

"The Pressure of Earth-Filling on the Bracing of Trenches." Trans. Am. Soc., C. E., Vol. LX., 1908.

"Calculation of Stresses in Solid Arches." University of Colorado Journal of Engineering, No. 4, 1908.

Professor Herbert S. Evans:

"High Voltage of Incandescent Lamps." University of Colorado Journal of Engineering, No. 4, 1908.

Assistant Professor Jacob H. Wallace:

"Descriptive Geometry of the Worm and Gear." University of Colorado Journal of Engineering, No. 3, 1907.

"Cylinder Port Velocities." Am. Soc. Mech. Engrs., 1907.

"Angular Variations between a Shaft Governor and the Fly Wheel." University of Colorado Journal of Engineering, No. 4, 1908.

Assistant Professor Saul Epsteen:

"Graphical Illustration of Convergence of Series." University of Colorado Journal of Engineering, No. 4, 1908.

"Probable Error of Measurement of a Unit of Length." University of Colorado Journal of Engineering, No. 3, 1907.

Mr. C. C. Williams:

"Sewage Disposal of Boulder, Colorado." University of Colorado Journal of Engineering, No. 4, 1908.

"Systematic Analysis of Cost Data." Engineering-Contracting, January 1, 1908.

Mr. A. P. Poorman:

"The New Campus." University of Colorado Journal of Engineering, No. 4, 1908.

Mr. Howard C. Ford:

"Reinforced Concrete Arch." University of Colorado Journal of Engineering, No. 3, 1907.

Graduates of the College of Engineering Appointed to University Positions.

The following graduates of the College of Engineering have been appointed to and are now holding university positions as follows:

John C. Fitterer, B.S. (C.E.) 1904, Professor of Civil Engineering, University of Wyoming, 1908.

Charles E. Rowe, B.S. (C.E.) 1900, Professor of Mining Engineering, University of Texas, 1906 to date.

Charles C. Cochran, B.S. (M.E.) 1906, Assistant Professor of Machine Drawing, University of Kansas, 1906 to date.

Howard C. Ford, B.S. (C.E.) 1904, C.E. 1907, Assistant Professor of Irrigation Engineering and Surveying, Iowa State College, 1907 to date.

Frederick W. Doolittle, B.S. (C.E.) 1907, Instructor in Theoretical and Applied Mechanics, University of Illinois, 1908.

Herbert D. Dwight, B.S. (E.E) 1904, Instructor in Mechanical Drawing, University of Oklahoma, 1908.

David R. Jenkins, B.S. (E.E) 1904, E.E. 1907, Instructor in Electrical Engineering, University of Colorado, 1905 to date.

Harry J. Kesner, B.S. (C.E.) 1907, Instructor in Bridge Engineering, University of Minnesota, 1907 to date.

Fred H. Kroger, B.S. (E.E) 1904, Instructor in Electrical Engineering, Cornell University, 1906 to date.

Harvey E. Murdock, B.S. (M. E.) 1906, M.E. 1908, Instructor in Theoretical and Applied Mechanics, University of Illinois, 1906 to date.

Howard E. Phelps, B.S. (C.E) 1907, Instructor in Civil Engineering, University of Pennsylvania, 1908.

Graduates of the College of Engineering in Commercial Positions.

Most of the graduates of the Electrical Engineering Department have secured positions with the General Electric Co.,

Schenectady, N. Y.; the Westinghouse Manufacturing Co., Pittsburg, Pa.; or with the Western Electric Co., Chicago, Ill. Electrical Engineering graduates have also obtained positions in the signal departments of railroads, with power development companies, and in other commercial positions.

The graduates of the Civil Engineering Department have secured positions in the bridge and building departments of railroads, in the engineering departments of railroads, with bridge companies, with the U. S. government in the Reclamation Service and the Geological Survey. Civil Engineering graduates have also obtained positions with irrigation engineers and power companies in Colorado and surrounding states.

Graduates of the Mechanical and Chemical Engineering departments have found employment with railroads, with manufacturing concerns, chemical works, beet sugar factories and in other commercial positions.

Many of the former graduates of the College of Engineering have now reached positions of responsibility in engineering operations, and this fact together with the improved standards of instruction has made the demand for graduates greater than the supply.

Growth of the Different Departments.

The number of students in the different departments for the past six years is given in the following table:

	1903-04	1904-05	1905-06	1906-07	1907-08	1908-09
Civil Engineering.....	41	43	59	68	95	108
Electrical Engineering	87	100	87	112	128	119
Mechanical Engineering.....	14	18	16	21	26	32
Chemical Engineering..... ..		12	14	14	22	11
Total 142	173	176	215	271	*270	

*Actual number of students October 1, 1908. The enrollment will be considerably increased.

Engineering Research in the University of Colorado.

The following research work has been completed, is now in progress, or will be carried on by the different departments if the necessary funds are available.

Civil Engineering Department.

Work Completed or in Progress.—During the last college year work has been carried on by the department on "Pumping for Irrigation." This work was done as thesis work, and the results will be ready for publication at an early date as a special engineering bulletin.

In 1906-07 a series of experiments was carried on in the Civil Engineering Laboratory on "The Comparative Value of Slag and Sandstone as a Concrete Aggregate." This work was done in co-operation with the Union Pacific Railroad. An abstract of the results of this investigation was published in the University of Colorado Journal of Engineering, No. 4

In 1907-08 a series of experiments was carried on in the Civil Engineering Laboratory on "Bond Stress of Steel and Concrete."

Experiments are now under way in the Civil Engineering Department on "The Pressure of Wheat in Bins." Professor Ketchum carried on a series of experiments while he was at the University of Illinois, and in 1907 published a book entitled "Design of Walls, Bins and Grain Elevators," which contains a description of the above tests and a resume of all the tests made up to date. This investigation will be carried on by Mr. C. C. Williams, Instructor in Civil Engineering, as thesis work under the direction of Professor Ketchum.

This is a very important line of investigation and one in which the University has an opportunity to make a reputation and to render a considerable service to the State. A fund of about $300 is needed to carry on this work the present year.

Mr. A. P. Poorman, Instructor in Civil Engineering, is now at work on "Tests of Colorado Building Stone" as a thesis for the degree of Civil Engineer. A fund of $200 is needed to carry on this work.

During the past year the department has made a study of the sewerage system of Boulder, Colorado. This work was done by Mr. C. C. Williams and by the senior students in connection with thesis work. A short article on this subject was published in the University of Colorado Journal of Engineering, No. 4.

In addition to the above, Professor Ketchum has contributed several articles to technical journals and has published two tech-

nical books. The book entitled "The Designs of Walls, Bins and Grain Elevators" is the first book written on these subjects, and has been well received in this country and abroad. The book entitled "The Design of Highway Bridges" is now ready for distribution. The book has been prepared especially for the author's classes.

Timber Testing Station.—The U. S. Department of Agriculture, Division of Forestry, in co-operation with the University, has established a Timber Testing Station in connection with the Laboratory of Applied Mechanics of the Civil Engineering Department. Similar laboratories have already been established at Yale University, Purdue University, University of California, and the University of Washington.

The equipment of the Applied Mechanics Laboratory has been increased by the addition of a 200,000-lb. Riehle Beam and Column Testing Machine that is capable of testing a beam sixteen feet long or a column eight feet long; a 30,000-lb. Olsen Tension Testing Machine for use in making standard compression and tension tests; a compressometer; a drying oven; a power planer and a power saw; and other necessary minor apparatus for making timber tests. This additional apparatus makes the equipment of the Applied Mechanics Laboratory equal to that of any of the timber testing laboratories at other universities.

In addition to the engineering staff of the Civil Engineering Department, the Forest Service will maintain at the laboratory an experienced timber testing engineer, with a corps of assistants. All the facilities of the laboratory will be available for the purposes of instruction and investigation by the department. Varied tests on many different kinds of timber will be constantly in progress. These tests will be conducted in accordance with the methods developed by the expert engineers of the Forest Service, and will form a part of the work of the Forest Service covering the whole United States. This laboratory offers facilities for instructional purposes second to none in the country.

Work to be Undertaken.—In addition to the above, the Civil Engineering Department should take up the following lines of investigation:

Road Laboratory.—A road laboratory should be installed to

test the different road building materials in the state. Work of this character is being carried on by the University of Illinois, Iowa State College, and other institutions, and similar work in this State should prove of inestimable value. In connection with the laboratory work, investigations should be made on "The Use of Colorado Crude Oil for Roads;" sample roads should be built and a special study should be made of road building in Colorado. A completely equipped road testing laboratory can be installed for approximately $5,000 exclusive of room accommodations.

Irrigation Investigation.—Experiments should be carried on by the department on the duty of water; the methods of treating alkali land; and the work on "Pumping for Irrigation" should be completed. Experiments should be made on improved methods for measuring water.

Power Investigation.—Investigation should be made on the flow of water in conduits; on the discharge of large weirs; on the flow in large pipes under pressure, and other problems of a similar character. The University of Colorado is well located for this work, which offers excellent opportunity for research in lines that will be of great service to the State.

Sanitary Survey.—The present condition of the sewerage and water supply systems of most of the towns in the State is very unsatisfactory. The State of Colorado should follow the lead of New York, Ohio, and other Eastern states, and should place the construction of all sewerage and water supply systems under the direction of the State Board of Health, with the consulting engineer of the Board located at the State University. The Civil Engineering Department should also be prepared to make commercial analyses of sewage and water.

Commercial Tests.—In connection with the Laboratory of Applied Mechanics considerable work can be done in testing special forms of construction and making commercial tests that cannot be carried on by the government. This would include tests of timber, mine props, brick, stone, cement, concrete, etc. In connection with thesis work it will be possible to carry on investigation in different lines that will be of considerable scientific interest. To carry this work on properly will require a special appropriation for materials and apparatus.

Electrical Engineering Department.

Work Completed or in Progress.—The department has accumulated a considerable amount of data of value to the general public. Some of this information has been printed and other data will be ready for publication at an early date.

Incandescent Lamps.—Tests have been made of the light distribution, efficiency, and length of life of the different types of incandescent lamps. Some additions to the present equipment of the photometer room in the way of modern improved appliances, are needed to carry on this work satisfactorily.

Shades and Reflectors.—The effect of using different shades and reflectors on incandescent lamps has been studied, and the relative values for different purposes determined. The importance of this subject is but little realized by the average user of electric lights.

Accuracy of Wattmeters.—A report of tests of various types of wattmeters as to accuracy under wide changes of load, also a study of the effect of abnormal voltage conditions, such as frequently obtain on commercial lines, was published in the University of Colorado Journal of Engineering, No. 4, and reprinted in the Western Electrician.

Electrolitic Action in Reinforced Concrete.—Tests on the electrical conductivity of concrete and the electrolitic corrosion of steel anchors imbedded in concrete were made in connection with thesis work. An abstract of this thesis was published in University of Colorado Journal of Engineering, No. 2. Additional experiments should be made over a period of years and through a wide range of practical conditions.

Railroad Signalling.—A study has been made in connection with thesis work on Circuit Determinations for Automatic Block Signals. This work was done in co-operation with the Union Pacific Railroad on their track near Denver.

Mercury Arc Rectifier.—Special study has been made of the mercury arc rectifier. This is a very important subject on account of the substitution of alternate current systems for direct current system. The department has only one type of this appliance and will need additional apparatus to carry on systematic tests.

Work to be Undertaken.—In addition to the above the Elec-

trical Engineering Department should take up the following lines of investigation:

Electric Railway Tests.—The University of Colorado should have an electric railway test car for student and experimental research work. Such car is owned jointly by the University of Illinois and the Illinois Valley Traction Co. and has proven of great value to both parties. The cost of such a car to the University cannot be definitely determined until certain matters of detail are taken up with the manufacturing company. The University of Illinois test car cost approximately $6,000. An electric test car operated on the new Denver-Boulder line should prove particularly valuable in view of the fact that this is an alternating current system, while the others in use are on direct current system.

Lightning Protection.—Tests should be made on protective devices as applied to high tension transmission lines. The mountainous sections of this State are subject to lightning discharges and a careful study of this problem would be of great commercial value. To carry on this work requires an initial appropriation of $1,000.

Electrical Standardizing Laboratory.—A standardizing laboratory is needed in Colorado to make commercial tests of instruments as well as for experimental purposes. The establishment of such a laboratory would enable the College of Engineering to keep in close touch with the electrical work in the State and surrounding country. The cost of this laboratory complete is approximately $5,000, while an initial start might be made with $2,500.

Electrical Heating and Cooking Devices.—A careful study should be made of the various types of electrical heating and cooking devices to determine their safety, efficiency, and relative cost of operation. This work would require initial appropriation of $250.

Electric Lighting of Country Homes.—This problem is receiving considerable attention throughout the country, and is of considerable importance in this State. The sources of power for these lighting plants include water power, wind mills, gasoline engines, etc. To make a study of this problem there should be a test station on the campus and a second one out on the plains,

and these should include tests extending over a period of years. Such stations could be equipped at a cost of about $1,500.

Mechanical Engineering Department.

Work Completed or in Progress.—The department has done some work on the analysis of Colorado coal. An abstract of a thesis on this subject was published in the University of Colorado Journal of Engineering, No. 2.

Work to be Undertaken.—The analysis of Colorado coal should be continued and completed, and the following lines of investigation should be taken up:

Lignite Coals.—An investigation should be made of the method of burning lignite in order to determine the most efficient conditions. Very little work has been done along this line, and the users of lignite are now operating under very wasteful conditions.

Gas Engines.—A study should be made of gas engines and air compressors in order to determine the drop in efficiency due to altitude.

Power Developments.—The department should make a study of the power developments of the State. This work should be taken up in conjunction with the Civil and Electrical Departments.

Summary.

Special attention is called to the following recommendations, most of which have been outlined in the preceding discussion:

Graduate Courses.—Graduate courses are now offered in the different engineering departments as described in the University catalogue. The courses in Power Plant Engineering, Gas Engine Design, Hydraulic Design, Irrigation Engineering Structures, Fuel Analysis, Reinforced Concrete Construction, Electrical Power Plant Design, Mine Buildings and Mill Structures, and Electric Traction especially meet the needs of Colorado and additional facilities should be provided for this work.

Engineering Experiment Station.—In addition to the work now being done by the Timber Testing Station, the Civil, Electrical, and Mechanical laboratories, and the departments of Chemistry and Geology, provision should be made for the following lines of investigation: Road Laboratory; Irrigation Investiga-

tions; Power Investigations; Sanitary Survey in co-operation with the State Board of Health; Commercial Testing Laboratory; Tests of Colorado Building Stones; Tests of the Pressure of Grain in Bins; Tests of Reinforced Concrete; Tests of Incandescent Lamps; Tests of Shades and Reflectors; Tests of the Accuracy of Wattmeters; Tests of Electrolysis of Iron and Other Metals; Railroad Signalling; Electric Railway Tests; Lightning Protection; Electrical Standardizing Laboratory; Tests of Electric Heating and Cooking Devices; Electric Lighting of Country Homes; Tests of Coal; Study of Lignite Coals; Tests of Gas Engines; Study of Clays in Connection with the Manufacture of Cement, Lime and Brick; Electricity as Applied to Mining; Tests of Mine Timbers.

SCHOOL OF MEDICINE.

At the end of the session of 1906-1907, at his own earnest wish, Dr. Luman M. Giffin resigned his deanship, retaining, however, the Chair of Surgery and the position of Hospital Superintendent. Dr. William P. Harlow, who had joined the Faculty two years previously as Professor of Clinical Diagnosis, was selected to succeed Dr. Giffin. Dr. Martin E. Miles resigned the Chair of Anatomy, September, 1907, and was succeeded by Dr. Edward F. Dean. Dr. Dean had been at the head of the same department in the Medical School of the University of Denver for about ten years. September, 1907, Dr. O. P. Johnstone was succeeded in the Chair of Pathology by Dr. Ross C. Whitman. At the same date Dr. Alvin R. Peebles was added to the Faculty as Instructor, later as Assistant Professor of Medicine and Director of the newly established Clinical Laboratory at the Hospital. Dr. Peebles had served for several years in a similar capacity in the Medical Clinic at Ann Arbor. At the close of the last year Dr. Arthur McGugan resigned the Chair of Neurology and Psychiatry and has been succeeded by two lecturers, Dr. Edward Delehanty, one of our own alumni, and Dr. George E. Neuhaus, a graduate of the University of Berlin. Also Dr. Dessie B. Robertson was succeeded in the Chair of Bacteriology by Dr. Clough T. Burnett, Assistant Professor, who has had several years' experience in teaching this subject in the Medical department of the University of Michigan. The following additional changes are to be noted: September, 1907, the resignation of Dr. John A. Russell, Instruc-

tor in Minor Surgery and Bandaging, the appointment of Dr. John Andrew, Instructor in Anatomy, and Dr. Frank R. Spencer, Instructor in Neurology; September, 1908, the appointment of Dr. Eugene H. Robertson, Lecturer in Electro-Therapeutics, and of Dr. William W. Grant, Lecturer for one year in place of Dr. Charles S. Elder, who is on leave of absence. Doctors Reed, White and Campbell have been made Instructors.

Attendance.

For the current year the registration is still far from completed; at the end of the first week of the session, however, the registration showed a large increase.

The Six Years' Course.

By vote of the Regents, the department was last spring committed to the policy of requiring two years' preparatory work for admission to the School, this change to take effect with the opening of the session of 1910-1911. The six years' course thus demanded will lead to two degrees, viz., A.B. and M.D. This increase in admission requirements is necessitated by the rapidly extending range of the modern medical curriculum, and has already been adopted by many of the best schools of the country, and it may be added that many of the State Examining Boards even are committed to the increased requirement, so that, even had we wished to remain on the present four-year basis, we were driven to the change. Any concern which might have been felt as to the effect of the change on the attendance has been largely removed by the character of the registration for the current year. A very large proportion of this year's entering class have already had two or more years of college work, while an equally satisfactory number of six-year men are this year beginning their work in the college department.

The Dispensary.

Some years ago a dispensary was for a time maintained in the present Medical building, but on account, perhaps, of the rather remote position of the building, and the then small population of the city, the dispensary proved unsatisfactory, and was abandoned. Last spring, a new dispensary was opened in the heart of the city, and though it has been in operation only a few

months it has already proved an extremely valuable addition to our clinical facilities.

Ward Walks.

At the same time with the opening of the dispensary, "Ward Walks" were for the first time instituted in the Hospital. This extremely important element in the clinical training of students was largely made possible by the Regents, in voting a special rate to clinical, as opposed to private, patients, in the Hospital, thus making available a much larger number of patients for clinical teaching. It is expected that, as time goes on, and as patients discover that clinical cases in the Hospital receive the same careful attention as that accorded to private cases, and that the use for clinical teaching does not entail any great hardship, a steadily increasing number of patients will choose to avail themselves of the advantage of the lower rate.

The Clinical Laboratory.

A third important addition to the teaching facilities of the Medical School is found in the new clinical laboratory, which was opened last March in the Hospital. A large room on the ground floor of the Hospital has been fully equipped for making the fullest possible pathological, bacteriological and chemical examinations. For the first time it has become possible to fully train our students in this extremely important branch of medical science.

The Rearrangement of the Curriculum.

Finally, the studies of the third and fourth years have been separated, doing away with the arrangement by which alternate classes received the work of these years in a sequence the reverse of the normal, and making possible the arrangement of a curriculum for these years graded correctly and with regard to the proper sequence of studies, as is done in the first two years.

It would be difficult to say which of these four matters, the dispensary, the ward walks, the clinical laboratory, and the improved curriculum, is the most important individually, but there can be no manner of doubt that the four taken together constitute the most important and far reaching change for the better ever made by the department. It puts our teaching methods on a par with the best modern practice.

New Buildings and Equipment.

During the summer new quarters have been erected for the department of Anatomy, thus making available for classroom purposes the quarters formerly occupied. The improvement thus brought about is twofold. It moves the department from its former central location to one which is far better fitted for the purpose by its very remoteness, and the new building, even though designed to be only temporary, is better adapted to the purpose for which it is to be used, having been especially designed for the same. In conjunction with the new building there has been installed a freezing plant able to accommodate about thirty cadavers. The material can thus be cared for in the way which fits it best for the use to which it is to be put, and the new method will do away with the most objectionable features of the work of this department. We are advised that this freezing plant is the only one of its kind west of Kansas City. The Department of Anatomy has also added to its equipment many valuable charts, models, and specimens, to be used in teaching. During the past year the equipment of the Department of Pathology has been brought up to date, and the museum has received and is still receiving much new and valuable material. The latter will equip the department very fully for undergraduate teaching. Still further additions to the museum are, however, greatly needed to enable us to offer advance work to special students, and to offer facilities for research work in this branch. Additions to the library are also still much needed. The department of bacteriology is making large additions to its equipment, so that within a short time it also will be on a very favorable footing.

The New Building.

Constant changes in the use to which our available space is to be put have been necessitated by our rapidly increasing class requirements. One of the rooms formerly used as a private laboratory has been fitted up as a dark room for photography, of which large use is now being made as an adjunct to teaching. Another private room is used as the pathological museum, a use for which it is by no means well adapted. A third room, formerly used as private laboratory and preparation room by the Department of Pathology, being much too small for the purpose, has been changed into the greatly needed department office; the

laboratory has been moved into the quarters formerly used by the Department of Pharmacology, the latter being driven to share quarters with another department. The increased crowding thus brought about leaves "standing room only," with no space to install or use important equipment. The new building, already needed for many years, is thus rapidly becoming an absolute necessity, and it is to be hoped that the incoming Legislature will take steps to provide immediately for our needs in this direction.

The Removal of the Two Last Years of the Course to Denver.

With the accomplishment of this reform, the removal of the two last years to Denver, the most greatly needed, perhaps, of our present requirements, the department will be placed on an equal footing with any other school in the country. It is greatly to be hoped that the present Legislature will afford this opportunity. Certainly the interests of the State, in a matter so important as this, would seem to take precedence over all other interests which have to be considered.

Animal House.

A very pressing need, which can be very easily and cheaply met, is that room should be found somewhere for an animal house, in order that we may breed our own experimental animals, and so have an abundance of this kind of material at a very low price, instead of having, as at present, very scanty material at an exorbitant price.

A State Hygienic Laboratory.

The Department wishes to renew most emphatically the recommendation of two years ago, for a State Hygienic Laboratory, to be run in connection with the Medical Department. The importance of such an institution to the State at large can hardly be estimated. It would afford not only the means for a prompt and efficient fight against such diseases as Typhoid Fever (the incidence of which in Colorado is abnormally high), Tuberculosis, Diphtheria, Scarlet Fever, etc.; but it would afford an invaluable opportunity to give instruction to our students at first hand in the science of prophylaxis, and general preventive medicine, a branch of medicine, the successful practice of which has more to do with the general welfare of a community than any other. The most important and far-reaching researches and discoveries in medicine today are along the lines of preventive medicine, and

far-sighted philanthropists have in late years given generously to projects having this aim, as witness the McCormick and Rockefeller Institutes for Medical Research. Important work in the same lines, which is of special importance to the people of Colorado, as having a local bearing, would be made possible by the establishment of such a laboratory here, and the prosecution of such investigations might easily be of enormous importance to the whole population of the State. A very modest annual appropriation to cover the necessary salaries and clerk hire is all that is needed to initiate the work.

THE SCHOOL OF LAW.

During the past two years there has been a large increase in attendance in the Law School and the registration for the current year will far exceed any previous one. The average age of the matriculants is greater than in preceding years, while the continued increase in the percentage of college-trained students in the Law School indicates a gratifying tendency toward higher scholastic preparation on the part of those about to enter upon a professional career. Increased effectiveness in the end must result from this better preparation, which the Faculty has consistently endeavored to encourage.

Judge John Campbell having resigned as dean, Professor John D. Fleming, sometime Secretary and Acting Dean, was in the spring of 1908 appointed to the position of Dean of the School. Judge Campbell will continue his connection with the School as Lecturer upon the Law of Municipal Corporations. Professors Fleming, Reed, Pease, and Willard continue as resident Professors of Law. Fred G. Folsom has been added to the Faculty as Instructor in Law and Judge of the Moot and Practice Court. The regularity and efficiency of the work in the Moot and Practice Court has been greatly promoted. Mr. Edwin Van Cise, of the Denver Bar, has continued uninterruptedly in his work in regular course in the Colorado Code of Civil Procedure, and Mr. Robert S. Morrison and Mr. William H. Bryant of Denver have supplemented the regular class room instruction in the Law of Mines and Mining, while Mr. James W. McCreery of Greeley has continued his lectures on the Law of Irrigation and Water Rights. Increased facilities for instruction in the Law of Irrigation have for the current year and for the future been provided. When to

the foregoing are added the special lecturers, and instructors in regular attendance, for the teaching of other practical topics of the law, and when, moreover, the real and organic connection subsisting between the Law School and the other Departments of the University is considered, and the opportunities thus afforded the law students for study and improvement in collateral and cognate branches, the Regents feel that the Law School gives assurance of a high degree of usefulness and efficiency.

We repeat the expressions of our last report upon the general plan of teaching. The course is based upon the "case system" but remains a conservative combination of such system with text-book instruction and lectures by eminent practitioners. Such course, while national in its aim and scope, teaching the body of Anglo-American Law, is yet of special value to Colorado students and to all those who expect to practice in the mining and arid regions.

But few students now come to the bar examination for license to practice in this and other states from private offices. The private instructor in law is almost as rare as the old fashioned "preceptor" in medicine. The law student seeks the law school, and the University meets this want by offering to the sons, and daughters also, of the people, the opportunity of fitting themselves at nominal cost for useful and varied service. This has come to be a matter of common observation. A questionnaire recently sent out by one of the leading universities of the country (Illinois), elicited replies from nearly a thousand members of the legal profession, in cities and towns, from individuals and representatives of firms large and small, and those engaged in general and special practice. But seven of this number expressed a preference for preparation for the bar in a private office. The responses also showed the opinion to be almost universal that the only sensible thing for a young man to do who desires to become a lawyer is to enter the best law school accessible, and, having entered, to give his entire time to the work of the school and not attempt to combine it with work in a lawyer's office, or, indeed, with work in any other place unless compelled to by stress of circumstances.

The needs of the Law School are many; the most urgent being additions to the law library and a law school building. Through the munificence of a citizen of the State, Senator Simon Guggenheim, a building suitable to the needs of the Law School,

is promised by the beginning of the next school year in September, 1909. Until this time the Regents are not disposed to increase largely the number of books in the law library as the space in the quarters occupied by the School now available is hardly sufficient to accomodate the books at present on hand, some 3,500 volumes, and the students in attendance. When the new building is ready for occupancy the Faculty will request that the needs of the library be supplied as well as other pressing wants of the School.

The School continues a member of the Association of American Law Schools, an association of most of the leading law schools of the country, formed in 1900 for the purpose of elevating and maintaining the standard of legal education in all the states. It is advisable that a representative of the School should continue to be in attendance at the annual meetings of this association. The reports and proceedings of these meetings, held every year in conjunction with the meetings of the American Bar Association, furnish valuable data upon the subject of legal education throughout the country.

UNIVERSITY STATUTES. SEAL.

The rules of the Regents are being carefully revised and changes in the organization of the General Faculty have already been made. The organization includes: Advisory Council, consisting of the deans of the various colleges and schools; Senate, consisting of the resident heads of departments of all faculties; Faculties of Colleges and Schools, each consisting of the professors of the College or School. The rules of the Faculties have been revised and brought up to date. The organization of the Senate has been completed. For efficiency of administration the Senate has the following committees: General Conduct of Students; Student Organizations and Social Life; Student Assembly and the Dormitories and Dining Hall; Student Publications; Intercollegiate and other Oratorical and Debating Contests; The Bennett Prize; Athletics; High-School Day; Accrediting High Schools, Entrance Regulations, High-School Conference; Recommending for Honorary Degrees; Carrying out Plans of Commencement Week. The various Senate Committees relating to student interests are making a careful analysis of their problems and are looking toward efficient work. The Faculty of the Col-

lege of Liberal Arts has a Committee on reorganizing the scheme for the Bachelor's degree, a committee on college problems for discussion, and a committee on individual care of students, especially of freshmen. The Engineering, Medical and Law faculties already have more or less comprehensive schemes for the care of students.

A new seal has been adopted by the Regents, and it has been in use since September, 1908. The old seal was mainly a copy of the State seal, and the seal for some time used on University literature was never adopted by the Regents.

ORATORY AND DEBATE.

Since 1906, the oratorical and debating interests have been gaining ground steadily and very rapidly. Aside from the University literary and debating societies operating under student management, there are the oratorical and debating activities managed directly by the Senate Committee on Oratory and Debate. In 1906-7 there were held, under the direction of this Committee, the Annual Prize Oratorical Contest and one interstate debate, with the University of Utah. In 1907-8, besides the Oratorical Contests, there were held five inter-school and inter-class prize debates and interstate debates with the State Universities of Utah, Kansas, and Missouri. In 1908-9 there will be held, besides the Oratorical Contest and the inter-school and inter-class debates, four inter-state debates, with the State universities of Utah, Kansas, Missouri, and Texas.

These inter-state debates have already become an important factor in the University life and it is safe to predict will year by year become of greater and greater significance in the educational life of the State. This report takes no account of a score of contests held under the immediate direction of the Debating, Literary, and Scribblers' Clubs now flourishing independently of Faculty supervision.

PHYSICAL CULTURE AND ATHLETICS.

It is pleasing to note progress along the lines of Physical Culture; and we are now far ahead of our equipment. One of the pressing needs of the University is a large gymnasium arranged for the use of female as well as male students. This

should be carefully planned with regard to the steady growth of the institution. It may be found best to erect two such buildings, one with dormitory connections for girls, and one in close connection with a permanent athletic field for men. Until this is done a thorough course in this subject, such as ought to be available to every student and such as the larger universities offer cannot be given. At present the work is carried on by a Director who has charge of all athletics and gymnasium work with the aid of a coach for football, two student assistants in the gymnasium, and a graduate medical attendant for women, the last three on merely nominal pay.

The gymnasium and associated athletic work is conducted with reference to making the periods recreative and are carried along on hygienic and corrective lines aiming to give grace in bearing and proficiency in games.

Until 1907 the work was entirely voluntary. November 1, 1907, began required work for all first year students in the College of Liberal Arts. This program worked out very successfully and it is hoped that arrangements may be made to extend the required work to the freshmen of other departments and to the second year students as well.

Special attention is given to the four leading sports—Football, Baseball, Basketball, and Field and Track Athletics; and candidates for these teams receive systematic instruction and training.

A cross-country team works every afternoon during the autumn season.

Tennis is very popular among the students; a greater number of courts should be provided for their use.

Intercollegiate contests are carried on with teams both within and without the State, the rivalry being keen but generally characterized by a fair and manly spirit.

The supervision of athletics is in the hands of a Board of Control, composed of three members of the Faculty and two student representatives. This Board employs the services of a Graduate Manager, who is responsible for the finances of the Students' Athletic Association.

The following are the eligibility rules which are carried out:

In order to be eligible to represent the University in an intercollegiate athletic contest, a student

(a) Must be an amateur in the ordinary acceptation of the term;

(b) Must not have taken part in intercollegiate athletics for more than three years previous to the year in which he desires to compete;

(c) Must not have taken part in intercollegiate athletics the immediately preceding year at some other institution of college grade;

(d) Must be doing such work in at least two-thirds of the required work of his College (or School) that, if it is continued to the end of the semester, he shall be entitled to his credits in that work. This must be certified by the various professors;

(e) Must have satisfied the conditions of entrance with at least thirteen entrance units;

(f) Must be registered within two weeks of the beginning of the semester in which the contest, in which he desires to compete, occurs.

RELATION TO THE HIGH SCHOOLS.

Each year there is more recognition of the continuity of High-School and College work and this particular notion will be encouraged still more in the future. Beside the High-School visitor other members of the Faculty are aiding in the High-School work, are making the acquaintance of the High-School men and are conferring with them as to courses of study. The High-School visitor with the co-operation of the High-School Committee is doing all that can be done to further raise the standards of the schools accredited with the University. For schools not yet accredited the standards were considerably raised for the present year. There are now accredited fifty-two schools and several others will probably come up to requirements very soon. In the near future it is purposed to hold a conference of High-School and University men, similar to the conference of nineteen hundred and three, to discuss problems vital in particular to the High Schools. The High-School men have shown a most hearty interest in this matter and have suggested most of the topics for discussion. There is a well-marked disposition in most of the Colorado High Schools to employ University of Colorado teachers; at present the supply does not equal the demand. The College of Education will probably add to the supply. During the present year some sixty-five Uni-

versity of Colorado graduates were placed in school positions and of these twenty-five were placed in the High Schools. As a further indication of the High-School attitude toward the University the nineteen hundred and seven High-School Day was the most largely attended of any of the meetings thus far.

BUILDINGS AND GROUNDS.

Important improvements have been made in the last two years. The Chemistry Building was completed in the early part of this biennial period, and about $21,000.00 of the cost has been paid within the period. The "Nurses' Home" is a wooden cottage of twelve rooms, which was removed from a new addition to the University grounds and enlarged and adapted to its present use; its value now is about $3,500.00. Several sections have been added to the sheds on the south side. Ten lots adjoining the southeast part of the campus have been added by purchase at a cost of $10,000.00; this ground includes two brick cottages, and a wooden house which was removed and converted into the Nurses' Home. The Engineering Shops Building, completed during the last semester, is a brick structure 92x122. It contains drawing rooms, two wood shops, a machine shop, a forge shop, and a foundry; the cost was $32,132.00. A temporary Anatomy Building has been erected east of the Sheds at a cost of $1,300.00 to which should be added $2,000.00 for a refrigerating plant, making a total of $3,300.00; the plant is movable and can be placed in a new medical building. A Heating, Lighting, and Power Plant has been planned to be located east of the Shops across Regent Street on a triangle owned by the University. A temporary structure on this site—part of the foundation being permanent—is now nearly completed, and new power units have been purchased. The old plant is inadequate to do all the work for this year; when the new plant is finished this is to be abandoned and a steam pipe is to be carried from the new plant to the heating system.

A Law Building at a minimum cost of $50,000.00 has been offered as a gift by Hon. Simon Guggenheim, and the Regents have tendered an acceptable location west of the Library; the completed building is assured before September, 1909. The Macky Auditorium, to be erected by the gift of the late Andrew J. Macky, a distinguished resident of Boulder and one of its pioneers, is already planned, and specifications are in preparation.

Probably about $250,000.00 will be realized from the estate for the University; all this will be devoted to the Auditorium Building and its furnishings.

The improvements and repairs on buildings and the improvements on grounds are of necessity always considerable and constitute an important item of expense.

The following are some of the more important improvements on buildings: extensive changes a year ago in the Engineering Building incident to the removal of some engineering departments to the Shops; refitting recently the basement of the Engineering Building and adapting it to the needs of the Government Timber Testing Station; additions to the athletic training quarters; placing of standpipes in several buildings; adding fire escapes to the Science Building and the Hospital; finishing rooms in upper story of University Cottage; constructing Laboratory in Hospital.

We note the following improvements on grounds: extensive drains on the southeast quarter of the grounds; sidewalk fills on Regent Street; placing new electric light poles, and changing wiring to three-phase alternating; extending fence of athletic field; carrying high-pressure steam and air blast pipes from the Engineering Building to the Chemistry Building; repairing dam below the lake; extending a new six-inch water pipe across the grounds, south of the Library, and connecting at two points with the old four-inch main; planting trees on the Hospital grounds by the Botanical Department; and planting shrubbery near University Cottage.

NEEDS.

The Engineering Shops Building, the need of which was presented to the last Legislature, has been erected. By the gifts of Mr. Macky and Senator Guggenheim the Auditorium and the Law Building are provided for, and part of the addition to the grounds recommended has been made by purchase.

The need of a Heating, Lighting, and Power Plant, a Science and Museum Building, and a Medical Building remains and is much more urgent than two years ago. Besides, the Physics Department requires greatly enlarged space that can be provided only by a new building or an addition to the present Science Building. Sketches of the proposed buildings have been prepared and they will be presented to the Legislature. The attention of

the General Assembly is again called to the importance of providing for a Girls' Dormitory, a Main Building, additions to grounds and improvement of grounds, a Gymnasium, and completion of the Library.

The time has come when something definite should be done to develop research along both theoretical and practical lines in all scientific departments—Engineering, Medicine, Chemistry, Geology, Biology, including also such departments as Economics, Sociology, History, and Education. The College of Liberal Arts reports 46 subjects of research in which the departments could engage, were sufficient equipment and instruction provided, although a very limited amount of such work is now undertaken. The College of Engineering reports some 30 subjects of practical research, some of which have been undertaken, but most of which require additional facilities. The Medical School recommends a State Hygienic Laboratory in connection with the School which should prove of vast importance to the State. Most of these research subjects have a direct practical value for Colorado, and, if carried on, would altogether bring large practical returns. Reference is made to the reports of the colleges named. The Graduate School, the foundation of which has been carefully laid, should receive adequate support that our young men may find at home opportunities for genuine university work. The successful graduate schools of the country offer fellowships to able students, and some provision should be made for them here. We refer to the report of the Graduate School. Research and Graduate work are marks of the genuine university today, and some state universities are already devoting as much money to these features as the whole expenditure of the University of Colorado. Not a dollar, as yet, has been specially provided by Colorado for the development of research and the upbuilding of a Graduate School in its University. We recommend that a special fund for this purpose be provided by the coming Legislature.

The average annual expenditure of the biennial period, aside from new buildings, is $177,461.33, which is $24,723.43 greater than the average of the previous period. The annual income from all sources is about $175,000.00, which is less than the average actual expense of the last two years, much less than the present rate of expenditure, and very inadequate for the growing demands of the coming two

years. In two years the attendance has increased 30 per cent., and the teaching force, the appropriations for departments, and various regular charges have been increased nearly in proportion. The next two years will see as large a growth. Moreover there is a question of salaries for professors and instructors, which, considering the high cost of living, should be seriously weighed by the Legislature and the Regents. We have the old story of increasing population, wealth, attendance at State educational institutions, and a comparatively stationary valuation of property for taxation. Unless the valuation is very materially increased the income for the University will fall far short of the urgent needs.

The $145,713.33 credited by the Treasurer in his report, representing a special appropriation and a long unpaid emergency loan, has been used as follows: $68,555.08 for buildings and purchase of land, $62,274.40 to cover the loan reported October 1, 1906, and the remainder to meet a small part of the current expenses until the end of the State's fiscal year, November 30, 1908. [This report is made October 1.] The $7,055.83, also credited in the Treasurer's Report, being the last unpaid portion of the Governor Thomas emergency loan, stands as a special account.

The two great political parties in their recent State conventions endorsed the policy of giving the University's Medical Department the privilege of conducting the last two years of its work in Denver. The Medical Bill would naturally receive the endorsement of the coming Legislature.

Mr. Andrew Carnegie has increased the fund of the "Carnegie Foundation," intended to provide retiring allowances for professors, and the Trustees will hereafter include State universities in their list. The provisions of the gift require the en dorsement of the Legislature in case of each State university.

The Professor of Geology in the State University was made State Geologist by the last Legislature. His report as State Geologist will be forthcoming. We believe it will be found that much has been done with the limited appropriation granted, and that the State will get large returns by making greater use of the Geological Department of the University and increasing the small appropriation for Geological Survey and reports thereon.

GIFTS.*

Gifts during the past two years are as follows:

Class of 1906, University of Colorado, oil painting, Rocky Mountain scene, by Charles Partridge Adams.	$ 80.00
Class of 1907, University of Colorado, engraving, Cathedral in France	70.00
Subscription to build veranda to Nurses' Cottage	300.00

Civil Engineering.

Alpha Portland Cement Co., New York City, one bbl. Portland cement	$ 3.00
Atlas Portland Cement Co., St. Louis, Mo., 4 bbls. Portland cement	10.00
Illinois Steel Co., Chicago, Ill., 1 bbl. Portland cement	3.00
Iola Portland Cement Co., Iola, Kan., 1 bbl. Portland cement	3.00
Neptune Meter Co., New York City, trident water meter.	5.00
Pittsburg Meter Co., East Pittsburg, Pa., water meter	5.00
Portland Cement Co., Portland, Colo., 4 bbls. Portland cement	10.00
Sandusky Portland Cement Co., Sandusky, Ohio, 1 bbl. Portland cement	3.00

Electrical Engineering.

Arc Lamp	$ 5.00
Columbia Incandescent Lamp Co., St. Louis, Mo., sample incandescent lamp board	10.00
Garton-Daniels Co., Keokuk, Iowa, Garton lightning arrester	2.50
Hall Signal Co., Garwood, N. J., track signal relays and resistances for same	35.00
Hendrie & Bolthoff Mfg. & Supply Co., Denver, Wagner indicating wattmeter	100.00
Northern Colorado Power Co., Denver, high tension insulators	3.00
Recording wattmeter	15.00

*The proposed Law Building, gift of Hon. Simon Guggenheim, and the proposed Auditorium, gift of Hon. Andrew J. Macky, are not noted in this list.

Mechanical Engineering.

Blue prints ..... $ 25.00
Colburn & Co., Denver, universal couplings..... 25.00

Medicine.

Bethel H. Jackson, E. Orange, N. J., skiascope..... 12.00

Systematic Zoology.

E. Bethel, Denver, various specimens of insects collected in Colorado .....
Dr. N. L. Britton, New York City, leaves and fruits of Pyrus and Malus.....
O. Heidemann, Washington, D. C., specimens of Cercopidæ .....
Mrs. J. A. McNary, El Paso, Texas, Mantis from Texas..
S. A. Rohwer, Boulder, numerous specimens of insects collected in Colorado .....
Frank Springer, Las Vegas, N. M., larvæ and pupæ of Hemileuca, from New Mexico.....
Mrs. E. B. Williamson, Blufton, Ind., specimens of dragon flies .....
Value of above gifts..... 25.00

Geology.

Philip Argall, Selby, Calif., mineral and rock specimens..$ 40.00
F. F. Castello, Colorado Springs, 100 pounds Telluride ore, Mary McKinney Mine, Cripple Creek..... 5.00
A. E. Chase, Boulder, section pipe with calcium carbonate deposits from mine water, Georgetown..... 2.00
C. A. Chase, Denver, 100 pounds concentrates, Liberty Bell Mine 5.00
R. D. Crawford, Boulder, set of rock specimens, Sugar Loaf District 15.00
Paul Dean, Glenwood Springs, three specimens celestite, Castle Rock 2.00
Arthur L. Dierstein, Denver, one vivianite specimen, Leadville 2.00
G. W. Duncan, Cripple Creek, two specimens Telluride ore, Cripple Creek 1.00
John Flynn, Aspen, ores from Rico..... 2.00

R. D. George, Boulder, miscellaneous collection from Iowa, Nebraska, Illinois, New Mexico, and Nevada..$ 50.00
J. A. Hamilton, Denver, lithographic stone and fossil fish specimens 8.00
Dr. William P. Harlow, Boulder, gold and silver ores, Oregon 25.00
W. A. Kearns, Silverton, one specimen Freibergite..... 2.00
John Knight, Denver, 25 pounds hubnerite..... 2.00
C. F. Lake, Boulder, wolframite and gold and silver specimens, 150 pounds crude tungstun ore, Nederland.... 46.00
George A. Pughe, Longmont, wolframite specimens.... 5.00
Roy J. Randall, Broomfield, two cuprite specimens, Emma Mine, Grant Co., N. M..... 1.00
Harry E. Sovereign, Denver, minerals, Gilpin and Clear Creek counties..... 2.00
C. H. Sternberg, Lawrence, Kans., fossil leaves, etc..... 8.00
Frederick T. Smith, Leadville, specimens of vanadium ore 2.00
Hugh Thatcher, Denver, one specimen wire silver, one specimen argentiferous galena, three specimens calaverite, one specimen roasted gold ore, one specimen silver ore, Nevada ores, gold and silver ores, Goldfield and Tonopah..... 27.00
Harold D. Thompson, Cripple Creek, gold and silver tellurides, Cripple Creek 22.00
Dr. E. B. Trovillion, Boulder, one specimen galena chalcopyrite, Jamestown..... 1.00
B. W. Vallatt, Denver, complete set ores and associated rocks, Sunrise Mine, Wyoming..... 25.00
F. Zugelder, Gunnison, 40 specimens marble building stone, etc..... 15.00

Museum.

Dr. H. W. Allen, Boulder, Colo., series of white-tail deer antlers .....$ 8.00
William S. Bellman, Boulder, Colo., weasel and duck... 5.00
E. Bethel, Denver, Colo., Colorado mollusks..... 10.00
Dr. Calhoun, Clemson College, S. C., fossil and recent shells 10.00

Prof. Theodore D. A. Cockerell, Boulder, Colo., fossil and recent shells	$ 4.00
Hon. James Cowie, Boulder, Colo., sabine gull	2.00
Albert Dakin, Longmont, Colo., Colorado mollusks	15.00
H. O. Dunning, Boulder, Colo., badger	3.00
Ray Edson, Boulder, Colo., Brazil nut capsule	2.00
William Fleming, Boulder, Colo., mollusks	3.00
Junius Henderson, Boulder, Colo., fossil and recent shells	10.00
Prof. Francis Ramaley, Boulder, Colo., mounted herbarium specimens of Minnesota plants	50.00
J. W. Richardson, Boulder, Colo., fossil and recent shells from California	4.00
United States Agricultural Department, Washington, D. C., collection of fibers	15.00
Hon. Charles B. Ward, Boulder, Colo., reptile skin	5.00
Birds and mammals	10.00
Colorado mollusks	20.00
Fossils	15.00
Miscellaneous insects, plant specimens, seeds, etc., from various persons	10.00
Miscellaneous fossils and mollusks from various persons	15.00
Total	$1,280.50

Library.

Library gifts; also reported on page 76.

	Books.	Pamp.	Maps.
Baker, President James H.	58	233	
Canadian Geological Survey	10	88	
Carnegie Institution	37	42	
Cockerell, Prof. T. D. A.	20	38	
Colorado (State Reports, etc.)	37	76	
Cornell, Herbert	2	102	
Duane, Dr. Wm.	120	463	
Ekeley, Prof. John B.	5	20	
Georgia Geological Survey	15		

	Books.	Pamp.	Maps.	
Illinois Laboratory of Natural History	2	27		
Lester, Prof. O. C.	6			
Library of Congress	14	4		
Maryland Geological Survey	3			
Minnesota Public Library (Bound Per.)	53			
Missouri Geological Survey	5	4		
Murfree, Mrs. Wm. L.	98			
Ohio Geological Survey	10			
Phillips, Prof. John B.	13			
Ramaley, Prof. Francis		6		
Smithsonian Institution	10	72		
United States (various depts.)	303	1,426	11	
University of Chicago	14	53		
University of Colorado—Theses		218		
University of Michigan	1	31		
Wisconsin Geological Survey	10	4		
Yale University	9	2		
College Catalogs		1,002		
Miscellaneous	413	1,022		
Total library	1,268	4,933	11	$1,700.00
Total gifts				$2,980.50

Gifts previous to 1896	$27,207.00
Gifts, 1896-1898	11,556.00
Gifts, 1898-1900	7,042.00
Gifts, 1900-1902	756.00
Gifts, 1902-1904	1,949.00
Gifts, 1904-1906	7,123.75
Gifts, 1906-1908	2,980.50
Total	$58,614.25

REPORTS SUBMITTED.

We submit herewith the Pay-Roll of the University, Secretary's Fee Report, Report on Permanent Fund, Report on University Lands, Report of State Auditor, Treasurer's Report, Secretary's Report, Librarian's Report, Inventory of Property.

Respectfully submitted,

OSCAR J. PFEIFFER,
WILLIAM J. KING,
HAROLD D. THOMPSON,
THOMAS D. BAIRD,
CHARLES R. DUDLEY,
JOSEPH C. BELL,
Board of Regents.
JAMES H. BAKER,
President.

EDWIN J. INGRAM,
Secretary.

APPENDIX.

PAY-ROLL OF THE STATE UNIVERSITY (Annual).

Administration.

James H. Baker, M. A., LL.D., President	$ 5,000.00
Edwin J. Ingram, B. A., LL. B., Secretary Board of Regents	900.00
Fred E. Hagen, B. A., Secretary	1,300.00
Terry V. Ritchie, Assistant Secretary	360.00
Katharine Kalene, Stenographer	550.00
Frances B. Jones, Stenographer	480.00
Bovia McClain, Employment Bureau	300.00
Ida R. Carr, Students Aid	200.00
Additional clerical help in Registrar's office	150.00
	$ 9,240.00

College of Liberal Arts.

Fred B. R. Hellems, Ph. D., Dean, Professor of Latin	$ 2,600.00
Mary Rippon, Professor of the German Language and Literature	2,000.00
J. Raymond Brackett, Ph. D., Secretary of the Graduate Faculty; Professor of Comparative and English Literature	2,500.00
Ira M. DeLong, M. A., Professor of Mathematics	2,500.00
Charles C. Ayer, Ph. D., Professor of Romance Languages	2,500.00
George Norlin, Ph. D., Professor of Greek	2,500.00
Francis Ramaley, Ph. D., Professor of Biology	2,500.00
Melanchthon F. Libby, Ph. D., Professor of Philosophy	2,200,00
John B. Phillips, Ph. D., Secretary of the College of Commerce; Professor of Economics and Sociology	2,200.00
Clyde L. King, M. A., Acting Professor of Economics and Sociology.	
John B. Ekeley, Ph. D., Professor of Chemistry	2,500.00
Russell D. George, M. A., Professor of Geology	2,500.00

George C. Taylor, Ph. D., Professor of English	$ 1,800.00
Theodore D. A. Cockerell, Professsor of Systematic Zoology	500.00
George M. Chadwick, Professor of Music	1,200.00
James F. Willard, Ph. D., Professor of History	1,700.00
Vivian A. C. Henmon, Ph. D., Professor of Psychology and Education	1,800.00
Oliver C. Lester, Ph. D., Professor of Physics	2,100.00
Frank E. Thompson, B. A., Secretary of the College of Education; Professor of Education	2,100.00
Milo G. Derham, Ph. D., Assistant Professor of Latin	1,400.00
Ralph D. Crawford, M. A., Assistant Professor of Geology	1,200.00
Martha G. McCaulley, M. A., Dean of Women	1,200.00
Charles E. Chadsey, Ph. D., Lecturer on Educational Problems.	
Junius Henderson, B. A., Curator of Museum	250.00
Fordyce P. Cleaves, M. A., Instructor in Oratory	550.00
Charles B. Dyke, M. A., Instructor in Education	450.00
Henry A. Hartman, Ph. D., Instructor in Education	200.00
Arthur L. Tatum, M. S., Instructor in Chemistry	800.00
Samuel C. Black, M. A., D. D., Instructor in Hebrew	200.00
Ruby L. Carstens, M. A., Instructor in Mathematics	800.00
Margaret S. Carhart, M. A., Instructor in English	800.00
Joseph L. Kingsbury, B. A., Instructor in History	800.00
Mary K. Murphy, B. A., Instructor in German	600.00
Whitford H. Shelton, Ph. B., Instructor in Romance Languages	800.00
Wilfred W. Robbins, B. A., Instructor in Biology	800.00
Harry A. Curtis, B. S., (C. E.), Instructor in Chemistry.	800.00
Adolph G. Pierrot, Ph. B., Instructor in English	800.00
William R. Brackett, B. A., Instructor in Physics	800.00
Carl L. Rahn, Ph. B., Instructor in Education	800.00
Louisa Lehrritter, Assistant in Education	800.00
Cleophile Bell, B. A., Assistant in English Literature	200.00
John G. Todd, Assistant in Romance Languages	50.00
Edith M. Allison, B. A., Assistant in Biology	400.00
Jennie Robinson, Assistant in Biology	200.00
Fred D. Anderson, Assistant in Philosophy	200.00
Leroy Davison, B. A., Assistant in Economics and Sociology	200.00

Earl B. Millard, Stock Room Assistant	$ 200.00
Alfred H. Allen, Assistant in Chemistry	200.00
Philip G. Worcester, Assistant in Geology	200.00
Harry Aurand, Assistant in Geology	100.00
Roy M. Butters, Assistant in Geology	100.00
Easley S. Jones, B. A., Assistant in English	400.00
Timothy O. Holcomb, B. A., Assistant in English	200.00
B. Inez Stearns, Assistant in English	100.00
Ward H. Foster, B. A., Assistant in Psychology	100.00
Whitney C. Huntington, Assistant in Physics	400.00
Siebelt L. Simmering, Assistant in Physics	200.00
Ada Haldeman, Dean's Secretary	200.00
Other clerical service in Dean's office	350.00
Edith Rawlins, Clerk College of Education	180.00
	$56,730.00

Summer School.

Eighteen instructors	$ 2,480.00

College of Engineering.

Milo S. Ketchum, C. E., Dean; Professor of Civil Engineering	$ 2,600.00
Herbert S. Evans, E. E., Professor of Electrical Engineering	2,000.00
John A. Hunter, M. E., Professor of Mechanical Engineering	1,800.00
Saul Epsteen, Ph. D., Assistant Professor of Eng. Math.	1,200.00
Jacob H. Wallace, M. E., Assistant Professor of Engineering Drawing	1,200.00
David R. Jenkins, E. E., Instructor in Electrical Engineering	1,000.00
Clement C. Williams, B. S. (C. E.), Instructor in Civil Engineering	1,000.00
Alfred P. Poorman, B. S. (C. E.), Instructor in Civil Engineering	1,000.00
George L. Sullivan, B. S. (M. E.), Instructor in Mechanical Engineering	800.00
Axel E. Berggren, B. S. (M. E.), Instructor in Mechical Engineering	800.00
William Black, Jr., B. S., Instructor in Mechanical Engineering	800.00

James S. Mikesh, B. A., Instructor in Engineering Mathematics	$ 800.00
Harry C. Gardner, B. S. (C. E.), Assistant in Civil Engineering	400.00
Harold L. Ireland, B. S. (E. E.), Assistant in Electrical Engineering	400.00
George I. Gay, Assistant in Engineering Mathematics	200.00
David M. Dodds, B. S. (C. E.), Assistant in Engineering Drawing	400.00
S. Elizabeth Ellmaker, Dean's Secretary	200.00
Additional clerical work	150.00
	$16,750.00

School of Medicine.

William P. Harlow, B. A., M. D., Dean; Professor of Medical Diagnosis	$ 750.00
Luman M. Giffin, M. D., Professor of Surgery	200.00
John Chase, B. A., M. D., Professor of Ophthalmology and Otology	320.00
Thomas E. Taylor, B. A., M. D., Professor of Obstetrics.	320.00
William B. Craig, M. D., Professor of Surgery.	
E. Barber Queal, M. D., Professor of Physiology	200.00
George H. Cattermole, M. D., Professor of Medicine (Pediatrics)	100.00
Frank E. Waxham, M. D., Professor of Rhinology and Laryngology	160.00
Francis Ramalay, Ph. D., Professor of Histology and Embryology (salary noted elsewhere).	
Charles Fisher Andrew, M. D., Professor of Materia Medica and Therapeutics	100.00
Charles S. Elder, M. D., Professor of Surgery (Gynecology).	
Newton Wiest, M. D., Professor of Dermatology	320.00
John B. Ekeley, Ph. D., Professor of Chemistry (salary noted elsewhere).	
James R. Arneill, B. A., M. D., Professor of Medicine (Clinical Medicine)	320.00
Richard W. Corwin, M. D., LL. D., Professor of Surgery.	45.00
Charles B. Lyman, M. D., Professor of Surgery	320.00

John M. Foster, M. D., Professor of Otology	$ 160.00
Edward Jackson, M. A., M. D., Professor of Ophthalmology	160.00
Carroll E. Edson, M. A., M. D., Professor of Medicine (Theory and Practice)	320.00
Edward F. Dean, M. D., Professor of Anatomy	640.00
Ross C. Whitman, B. A., M. D., Secretary; Professor of Pathology	1,800.00
Arthur L. Kennedy, M. D., Assistant Professor of Medicine	320.00
Oscar M. Gilbert, M. D., Assistant Professor of Medicine	100.00
Alvin R. Peebles, M. D., Assistant Professor of Medicine	800.00
Clough T. Burnett, M. D., Assistant Professor of Bacteriology	800.00
Vivian A. C. Henmon, Ph. D., Lecturer on Psychology (salary noted elsewhere).	
Eugene H. Robertson, M. D., Lecturer on Electro-Therapeutics	200.00
George E. Neuhaus, M. D., Lecturer on Neurology and Psychiatry	320.00
Edward Delehanty, M. D., Lecturer on Neurology	320.00
William W. Grant, M. D., Lecturer on Surgery	320.00
Willard J. White, M. A., M. D., Instructor in Hygiene	50.00
Jacob Campbell, M. D., Instructor in Minor Surgery	150.00
Edward B. Trovillion, M. D., Instructor in Anatomy	150.00
Walter W. Reed, M. D., Instructor in Obstetrics	100.00
William A. Jolley, M. D., Instructor in Pharmacology	75.00
Wilfred W. Robbins, B. A., Instructor in Histology and Embryology (salary noted elsewhere).	
John Andrew, B. A., M. D., Instructor in Anatomy	150.00
Frank R. Spencer, B. A., M. D., Instructor in Rhinology and Laryngology	50.00
Philip A. Davis, M. D., Assistant in Obstetrics	50.00
Clay E. Giffin, B. A., M. D., Assistant in Surgery	50.00
James A. Philpott, Assistant in Pathology	50.00
Ammy B. Edgar, Assistant in Anatomy	50.00
	$10,340.00

University Hospital.

Jean McIntosh, Matron	$ 720.00
Twelve Nurses	1,152.00
Hospital employes, as cook, laundress, maids, porter	1,920.00
	$ 3,792.00

School of Law.

Appropriation for traveling expenses of professors and lecturers whose salaries are not indicated	$ 585.00
John D. Fleming, B. A., LL. B., Dean; Professor of Law and Associate Judge of Practice Court	2,500.00
Moses Hallett, LL. D., Dean and Professor of American Constitutional Law, *Emeritus.*	
John Campbell, M. A., LL. B., Dean *Emeritus;* Professor of Law of Private and Municipal Corporations.	
Albert A. Reed, LL B., Professor of Law	1,200.00
William H. Bryant, B. S., LL. B., Professor of Law.	
Edwin Van Cise, Professor of Law.	
William H. Pease, B. A., LL. B., Professor of Law	1,900.00
James F. Willard, Ph. D., Professor of American and English Constitutional and Political History (salary noted elsewhere).	
Fred G. Folsom, B. A., LL. B., Instructor in Law and Judge of Practice Court	1,000.00
Joseph L. Kingsbury, B. A., Instructor in History (salary noted elsewhere).	
Hugh Butler, Lecturer on Common Law Pleading.	
Luther M Goddard, LL. B., Lecturer on Law of Patents, Copyrights and Trademarks.	
Robert S. Morrison, Lecturer on Law of Mines and Mining.	
Charles S. Thomas, LL. B., Lecturer on Law of Evidence	
Henry T. Rogers, M. A., Lecturer on Law of Corporations.	
Lucius M. Cuthbert, M. A., LL. B., Lecturer on Roman Law.	
John A. Riner, LL. B., Lecturer on International Law.	
Platt Rogers, LL. B., Lecturer on Law of Irrigation.	
Thomas H. Hardcastle, B. A., LL. B., Lecturer on Equity Pleading and Practice.	

Ralph Talbot, B. A., Lecturer on Criminal Law and Procedure.	
Charles D. Hayt, Lecturer on Law of Taxation.	
Cæsar A. Roberts, M. A., Lecturer on Colorado Civil Code.	
Willard J. White, M. A., M. D., Lecturer on Medical Jurisprudence.	
Ernest L. Williams, LL. B., Lecturer on Conveyancing and Appellate Procedure.	
James W. McCreery, Lecturer on Law of Irrigation and Water Rights.	
Randolph Ballinger, Law Librarian	$ 150.00
A. Elmer Stirrett, Assistant Librarian	40.00
Frederic L. Tilton, Stenographer	40.00
Clerk of the Practice Court	50.00
Sheriff of the Practice Court.	
	$ 7,465.00

Library and Physical Training.

Alfred E. Whitaker, M. A., Librarian (12 months)	$ 1,700.00
Walter L. Barnes, Ph. B., Assistant Librarian (12 mos.)	1,100.00
Faith E. Foster, Assistant Librarian (12 months)	600.00
C. Belmont Preston, Assistant in Library (12 months)	300.00
Carl A. McLauthlin, Assistant in Library (9 months)	150.00
Granville B. Warner, Assistant in Library (3 months)	150.00
John D. Lobb, Assistant in Library (3 months)	90.00
Frank R. Castleman, B. S., Director of Physical Training and Athletics	1,500.00
Louis A. Reilly, Assistant in Gymnasium	120.00
————, Assistant in Gymnasium	100.00
Dr. Margaret L. Johnson, Physical Examiner for Women	50.00
	$ 5,860.00

Other Employees.

Joseph Klemme, Steward	$ 780.00
William W. Parce, Landscape Architect	200.00
George R. Moore, Carpenter	900.00
John Gumeson, Carpenter	960.00
Dan E. Hayward, Employee on Grounds	600.00
E. E. Barrows, Night Watchman	600.00

Other employees for regular care of buildings and grounds	$ 3,850.00
Charles E. Cummings, Engineer	1,200.00
Five Firemen	2,160.00
————, Janitor Main Building	480.00
————, and Assistant, Janitors Science, Engineering, Gymnasium, Library, and Old Anatomy Buildings	675.00
————, and Assistant, Janitors Shops, Chemistry Building, Men's Dormitory, and Cottage No. 2	675.00
————, Janitor Medical and New Anatomy Buildings	180.00
	$13,260.00

Summary.

Administration	$ 9,240.00
College of Liberal Arts	56,730.00
Summer School	2,480.00
College of Engineering	16,750.00
School of Medicine	10,340.00
University Hospital	3,792.00
School of Law	7,465.00
Library and Physical Training	5,860.00
Other Employees	13,260.00
	$125,917.00

SECRETARY'S FEE REPORT.

From October 1, 1906, to October 1, 1908.

Receipts.

Cash on hand, last report	$ 80.52
Notes on hand, last report	201.25
Cash in hands H. S. Visitor	100.00
Tuitions and fees from College of Liberal Arts and College of Engineering	21,575.00
Tuitions and fees from Law School	7,710.35
Tuitions and fees from Medical School	5,253.00
Hospital receipts	18,493.13
Chemistry fees	3,472.95
Room rent	2,244.80
Deposits	896.75

Summer School	$ 3,397.00
Miscellaneous	856.66
	$64,281.41

Deposits with Treasurer, Etc.

Deposited with William H. Allison, Treasurer	$63,995.77
Cash on hand H. S. Visitor	100.00
Notes on hand for tuition	178.00
Cash on hand	7.64
	$64,281.41

Respectfully submitted,

EDWIN J. INGRAM,
Secretary Board of Regents.

REPORT ON PERMANENT FUND.

Board of Regents, State University, Boulder, Colorado:

GENTLEMEN—In compliance with your request of October 22, we herewith send statement of the University Permanent Fund, October 1, 1908:

University Permanent Fund	$48,904.45
Invested	39,356.66
Available Cash	$ 9,547.79
Unavailable warrants, years 1889 and 1894	$27,763.87
Available warrants, year 1908	11,592.79
	$39,356.66
Total available fund	$21,140.58
Total unavailable fund	27,763.87
Total	$48,904.45

Very truly yours,

ALFRED E. BENT,
State Treasurer.

REPORT ON UNIVERSITY LANDS.

Status of University Lands on October 1, 1908.

	Owned.	Leased.	Rental.
Conejos County	80	80	$ 10.00
Jefferson County	2,760	440	35.60
Logan County	2,960.65	2,587.31	692.45
Washington County	1,440	720	82.00
	7,240.65	3,827.31	$820.05

Signed,

M. A. CAREY,

Chief Clerk, State Board of Land Commissioners.

Note.—Certain University lands are now included in government reserves, and the Regents are endeavoring to secure an exchange of other lands.

REPORT OF STATE AUDITOR.

University Tax Fund.

By Balance, October 1, 1906		$ 5,863.72
By receipts from levy		285,278.69
To amount paid University Treasurer	*$289,504.44	
To balance, September 30, 1908	1,637.97	
	$291,142.41	$291,142.41

University Income Fund.

By Balance, October 1, 1906		$ 373.60
By Receipts		2,779.52
To amount paid University Treasurer	$ *2,100.89	
To Refund	35.00	
To Balance, September 30, 1908	1,017.23	
	$ 3,153.12	$ 3,153.12

Special Appropriation.

By Appropriation S. B. No. 110, November 11, 1907	$100,000.00

To Warrants paid University Treasurer, November 11, 1907	$ 50,000.00	
To Warrants paid University Treasurer, April 15, 1908	50,000.00	
	*$100,000.00	$100,000.00

Deficiency Indebtedness.

Certificates of Indebtedness.

	Date of payment.	Interest.	Total.
No. 1	Jan. 31, 1907	$ 636.67	$ 5,636.67
No. 2	Jan. 31, 1907	636.67	5,636.67
No. 3	Jan. 31, 1907	636.67	5,636.67
No. 4	Jan. 31, 1907	636.67	5,636.67
No. 5	May 31, 1907	737.50	5,737.50
No. 6	May 31, 1907	737.50	5,737.50
No. 7	Oct. 15, 1907	845.83	5,845.83
No. 8	Oct. 15, 1907	422.91	2,922.91
No. 9	Oct. 15, 1907	422.91	2,922.91
	Total		*$45,713.33
	Jan. 2, 1907	$2,055.83	*7,055.83
			$52,769.16

*Note.—Here follows a comparison of the Auditor's payments and the Treasurer's receipts.

Auditor.	Treasurer.	
$289,504.44	$283,650.72	(A)
2,100.89	1,727.29	(B)
100,000.00	100,000.00	
45,713.33	45,713.33	
7,055.83	7,055.83	

(A)

Item credited by Treasurer in previous biennial report	$ 5,853.72
	283,650.72
	$289,504.44

(B)

Item credited by Treasurer in previous biennial report	$ 373.60
	1,727.29
	$ 2,100.89

TREASURER'S REPORT.

From October 1, 1906, to October 1, 1908.

Receipts.

Cash on hand October 1, 1906	$ 13,921.29
State Treas. General Fund, 2-5 mill	283,650.72
State Treas. Special Fund	100,000.00
State Treas. Emergency Fund, Peabody Administration.	45,713.33
State Treas. Emergency Fund, Thomas Administration.	7,055.83
State Treas. Land Income (interest and rent)	1,727.29
Interest on Investments (three special Univ. funds)	272.81
Receipts from Secretary Board of Regents	63,995.77
Due from E. J. Temple	200.00
	$516,537.04

Disbursements.

Warrants paid from October 1, 1906, to October 1, 1908.	$425,912.27
Interest warrants of previous period paid, representing difference between debt at date of last report and debt October 1, 1908	62,274.40
Cash on hand, General Account	15,285.52
Special Account	5,000.00
W. H. Allison, Custodian	7,298.91
Philo Sherman Bennett Fund	429.73
Balance Guggenheim Fund	36.21
Women's Fund, Special	25.00
Men's Fund, Special	25.00
Engineering Dep't., Special	50.00
Cash in the hands of E. J. Temple, former Secretary of Board of Regents	200.00
	$516,537.04

WILLIAM H. ALLISON,
Treasurer.

SECRETARY'S REPORT.

From October 1, 1906, to October 1, 1908.

Warrants issued in payment of expenses of the several departments of the University, during the biennial period, October 1, 1906, to October 1, 1908:

General Administration—Regents' service and mileage, President's and Secretary's salary, salaries of Registrar and his assistants, and all expenses of Registrar's office	$ 23,657.36
College of Liberal Arts—Instruction and expenses	93,860.93
Biology—Books, apparatus, supplies	1,953.76
Chemistry—Books, apparatus, supplies	4,782.48
Economics—Books, supplies	233.55
Education—Books, supplies	261.15
English—Books, supplies	258.70
Geology—Books, apparatus, supplies	4,916.79
German—Books, supplies	137.41
Greek—Books, supplies	334.14
History—Books, supplies	438.55
Latin—Books, supplies	275.23
Literature—Books, apparatus, supplies	819.96
Mathematics—Books, apparatus, supplies	408.72
Museum—Books, apparatus, supplies	1,259.31
Music—Books, apparatus, supplies	146.93
Philosophy—Books, supplies	156.12
Physics—Books, apparatus, supplies	1,443.34
Psychology—Books, apparatus, supplies	583.91
Romance Languages—Books	167.64
Systematic Zoology—Books, apparatus, supplies	536.17
College of Engineering—Instruction and expense	23,391.19
Civil Engineering—Books, apparatus, supplies	2,669.52
Electrical Engineering—Books, apparatus, supplies	2,101.36
Mechanical Engineering—Books, apparatus, supplies.	2,213.35
Engineering Mathematics—Books, apparatus, supplies.	127.78
General Engineering Drawing—Books, apparatus, supplies	494.13
Shops—Machinery, instruments, supplies	4,684.73

School of Medicine—Instruction, apparatus, supplies, hospital, dispensary, nurses' cottage, and other expenses (largely reimbursed by medical tuitions and hospital receipts)		$ 45,297.29
School of Law—Instruction, library, and other expenses (partly reimbursed by tuitions)		13,634.86
Summer School—Instruction and expenses (largely reimbursed by tuitions)		5,422.12
Preparatory School—Instruction and expenses		6,913.04
Library—Services, books, periodicals, binding, and supplies		12,041.67
Physical Training—Salaries for Physical Training, apparatus, and expense		2,559.84
Buildings and Grounds—		
Salaries (janitors, heating and lighting service, and care of grounds)	$21,940.98	
Repairs	7,515.57	
Insurance	2,118.63	
Water rent	752.50	
Fuel	10,814.26	
Horses	521.02	
Unclassified	965.86	44,628.82
Buildings and Grounds—		
New Buildings (including $10,000.00 for land)	$68,555.08	
Improvements on Buildings	5,077.40	
Improvements on Grounds	4,172.94	77,805.42
Furniture and Supplies		8,114.75
Printing		8,632.33
Stationery and Postage		2,649.41
High School Visitation, lectures by faculty members, etc.		2,519.45
Advertising		949.67
Refunds		1,932.51
General Unclassified Account (interest, $9,697.94; unclassified, $8,364.42)		18,062.36
Total for Biennial Period		$423,477.75

Warrants issued not paid by October 1, 1906		$ 5,487.65
Warrants issued not paid by October 1, 1908		3,053.13
	$	2,434.52
Warrants issued from October 1, 1906, to October 1, 1908		$423,477.75
		2,434.52
Sum paid by Treasurer		$425,912.27

Total Expenditure for Biennial Period	$423,477.75
On New Buildings (including $10,000.00 for land)	68,555.08
For Running Expenses (including usual necessary improvements and repairs)	354,922.67
Average Annual Expenditure, 1907, 1908	177,461.33

Respectfully submitted,

EDWIN J. INGRAM,
Secretary.

LIBRARIAN'S REPORT.

To the President and Board of Regents, University of Colorado:

GENTLEMEN—I have the honor to present herewith my report on the Library, covering the period from October 1, 1906, to October 1, 1908.

Additions.

The total number of volumes accessioned and placed in the library during the two years is 5,737, derived from various sources, as follows:

Gifts (public documents)	267
Gifts (miscellaneous)	1,334
Total gifts accessioned	1,601
By binding	1,035
By purchase	3,101
Total accessions	5,737

Donations.

Gifts have been received, entered, and acknowledged as follows:

Books	1,268
Miscellaneous—College catalogs, pamphlets, etc.	4,933
Maps	11
	6,212

Note—Donations are shown in detail on p. 58.

Binding.

Periodicals (completed volumes)	1,220
Books issued in paper	815
Newspapers	26
Volumes rebound	425
Total	2,486

Summary.

Number of volumes reported October 1, 1906		38,555
Additions—		
By gift	1,601	
By binding	1,035	
By purchase	3,101	5,737
		44,292
Deductions—		
Cancelled (lost and worn out)	8	
Less returned and found	5	3
Total number of volumes in library Oct. 1, 1908		44,289

Respectfully yours,

ALFRED E. WHITAKER,
Librarian.

INVENTORY OF UNIVERSITY PROPERTY.

The following estimates, taken from inventories recently made, are presented as fair approximations:

Grounds.

Campus, sixty-three acres (estimated present value unimproved)	$126,000.00

Improvements, as fences, grading, roads, walks, pipes, drains, trees, lake, bridges, athletic field	$ 34,000.00
	$160,000.00

Buildings.

(Approximate cost of each.)

Main Building	$ 40,000.00
Library (not including extension of heating pipes in ground)	75,500.00
Gymnasium	6,000.00
University Cottage	8,000.00
Cottage One	6,000.00
Cottage Two	4,000.00
Woodbury Hall	25,000.00
Two Brick Houses (on new purchase)	2,500.00
Hale Science Building	50,000.00
Chemistry Building	43,000.00
Class-Room Building (Old Anatomy)	3,000.00
Engineering Building	50,000.00
Engineering Shops Building	32,500.00

Heating, Lighting, and Power Plant—

Building (temporary)	$3,000.00	
Equipment (new)	6,600.00	
Equipment (old)	5,459.60	
Steam and air mains	9,279.00	
Electrical construction	4,615.06	28,953.66
Medical Building		9,500.00
Anatomy Building (new, with refrigerator)		3,300.00
Hospital (furnished)		15,000.00
Nurses' Home		3,500.00
Observatory		200.00
Ice House		200.00
Stable and Sheds		1,700.00
		$407,853.66

Furniture, Implements.

Room furniture, as chairs, settees, desks, tables, moveable cases, pictures, office furniture, hospital and dormitory and dining hall equipment, shades, jantor's supplies, gymnasium apparatus (value)	$30,117.90
Team, implements, tools, carpenter's supplies (value)	2,957.30
	$33,075.20

Library.

Library (value)	$65,000.00

Apparatus, Etc.

College of Liberal Arts—	
Biology	$ 3,616.70
Chemistry	8,608.55
Economics	170.00
Education	539.50
Geology	9,237.00
German	55.00
Greek	366.00
Latin	15.00
Literature	836.15
Mathematics	960.50
Music	287.60
Physics	9,376.30
Psychology	1,441.80
Romance Languages	10.00
College of Engineering—	
Civil Engineering	11,552.55
Electrical Engineering	9,179.89
Mechanical Engineering	3,414.16
Shops	10,026.00
General Engineering Drawing	701.60
School of Medicine—	
Medical and Anatomy	5,179.54
Hospital	564.30
Hospital Clinical Laboratory	603.15
Dispensary	147.17

School of Law—	
Inventory	$ 452.00
	$77,340.46

Collections.

Art	$ 1,899.00
Biological	6,196.50
Geological and Mineralogical	5,095.00
	$13,190.50

Summary.

Grounds	$160,000.00
Buildings	407,853.66
Furniture, Implements	33,075.20
Library	65,000.00
Apparatus, etc.	77,340.46
Collections	13,190.50
	$756,459.82

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