

THE
UNIVERSITY OF MISSOURI
BULLETIN

GENERAL SERIES.

VOLUME 14

NUMBER 6

ANNOUNCEMENT
OF THE
SCHOOL OF MEDICINE
1913-14



UNIVERSITY OF MISSOURI
COLUMBIA, MISSOURI
June, 1913

THE
UNIVERSITY OF MISSOURI
BULLETIN

GENERAL SERIES.

VOLUME 14

NUMBER 6

ANNOUNCEMENT
OF THE
SCHOOL OF MEDICINE
1913-14



UNIVERSITY OF MISSOURI
COLUMBIA, MISSOURI
June, 1913

CONTENTS

	Page
The Profession of Medicine.....	3
Advantages and Disadvantages of Medicine as a Profession...	3
Requirements for Success in Medicine.....	4
Premedical Education	4
Medical Education	6
Fundamental Medical Education	7
Clinical Medical Education	8
Essentials of an Acceptable Medical College.....	8
Criteria for Judging Schools	11
Where to Find Information	12
School of Medicine of the University of Missouri.....	13
Aim of the School of Medicine	13
Preventive Medicine	13
Historical Statement	14
Organization and Support	15
Faculty of the School of Medicine.....	15
Buildings and Equipment	18
Parker Memorial Hospital	20
The Training School for Nurses.....	21
Medical Curriculum	22
Medical Certificate	26
Entrance Requirements	26
Combined Work in Arts and Medicine	26
Graduate Work in Medical Sciences.....	29
Publications, 1912-1913	30
Low Cost of Medical Education	31
High Standing of the School of Medicine.....	32
University Calendar	33
Information about the University	34

THE PROFESSION OF MEDICINE.

The following pages will be devoted to a brief consideration of certain questions of interest to all who expect to follow the profession of medicine. It is important that all prospective medical students should know the present status of medicine, its advantages and disadvantages as a profession, the opportunities which it offers and the qualifications necessary for success. It is especially important that the general principles underlying sound medical education be clearly understood and that data be made available which will enable those interested to judge of the relative merits of the numerous medical schools in this country.

Advantages and Disadvantages of Medicine as Profession.

Some of the more obvious disadvantages of medicine as a profession may first be mentioned. Among these are the irregularity of the work, the exposure and danger, the severity of physical and mental strain, and the relatively poor remuneration in comparison with the necessary skill and education. It should be clearly understood that competition is severe, for the medical profession (like most others) is overcrowded. There are today in the United States nearly 140,000 licensed practitioners (not counting irregulars of various kinds), or an average of about one to every seven hundred people. In proportion to the population, this is twice as many as are licensed in Great Britain, and over three times as many as in France and Germany. Moreover, with the increase of popular knowledge regarding hygiene and preventive medicine, the need for medical service is in some respects diminishing.

As an offset to the foregoing, however, the medical profession has numerous advantages to offer to those properly qualified. In the first place, for those who achieve eminence by reason of unusual ability and thorough training, the financial rewards are great. This is especially true in surgery and certain other special lines. Even aside from these exceptional cases, every really well-qualified practitioner is reasonably sure of a good income.

Money, however, is by no means the chief attraction which the profession of medicine has to offer. There is a fascination about the work which is difficult to explain, but which is nevertheless characteristic. Successful practitioners enjoy their work, in spite of hardships and difficulties. Moreover, even in this materialistic age, the philanthropic aspect of the practice of medicine appeals strongly to many. From this point of view, no profession offers greater opportunities for public and private service.

Another phase of medical work, which to many is more attractive than the ordinary practice, is that of teaching and investigation in the various medical sciences. There is at present a strong demand, which is likely to continue, for well-trained men who will devote themselves to Anatomy, Physiology, Pathology, etc. While

not so remunerative as the practice of medicine, positions in these and similar branches offer good salaries and an attractive career to those whose tastes and talents incline toward teaching and research.

Finally, so far as competition is concerned, there is no question that the medical profession is overcrowded, but it is **overcrowded with incompetents**. It is true that our leading surgeons rank among the best in the world. But on the other hand, owing to the low standards of medical education which have prevailed during the past, it must be confessed that the rank and file of medical practitioners average very low in efficiency. Nowhere is it more emphatically true that "there's plenty of room at the top." No man of reasonable ability with thorough collegiate and professional training need fear the competition. And as the general public is learning to discriminate more carefully, the demand for well-qualified physicians grows stronger. It is therefore exceedingly important for the prospective medical student to consider carefully the qualifications necessary for success in this profession, in order that he may prepare himself accordingly.

Requirements for Success in Medicine.

The qualifications necessary for success in medicine include certain personal characteristics plus an adequate training through premedical and medical education. Among the personal qualifications, both physical and mental vigor are of primary importance. Weaklings and dullards have no chance for success in the field of medicine. Integrity is also necessary, for only those of the highest character are fit to uphold the ideals of the medical profession. Finally, natural fitness and inclination for medical work should be considered. Few can hope to maintain the prolonged effort necessary to win success in this great field, unless the work is in accordance with their natural tastes and talents.

Premedical Education.

Assuming that one has the requisite personal qualifications, the next question which arises concerns the education, both premedical and medical, which is necessary for success. In considering this matter, it must be remembered that medicine is an applied science. For success in any applied science, two things are necessary: first to master your science; and, second, to learn how to apply it. To master the difficult science of modern medicine, it is absolutely necessary to have a thorough preliminary scientific training.

The amount and character of the necessary preliminary training for medicine is a theme which has been much discussed in recent years. While there are still different views concerning details, there is with reference to the essential points a general consensus of opinion among those entitled to speak with authority in this matter. The first point which should be emphasized is that a **high-school education alone is insufficient**, especially in science, to prepare a student for the difficult medical curriculum of today. The necessity for collegiate work preliminary to medicine is so important and so clearly recognized that it is now required by law in ten States, in-

cluding Minnesota, Iowa, North and South Dakota, Kansas, Indiana, Connecticut, Colorado, Utah and Vermont.

In these States, in order to be admitted to examination for license to practice, one must show that he took at least one or two years of collegiate work, in addition to the equivalent of a four years' high school course, before entering a medical school. Before the time when those now entering medicine will be graduated, this legal requirement will doubtless be established in many other States. Students should therefore beware of entering medicine without preliminary collegiate work.

While it is generally recognized that at least one or two years of preliminary collegiate work are necessary, few will urge, as a general requirement, the completion of four years of college work before entering medicine. Indeed it is probable that as a general rule this is an unnecessary expense of time and money, and postpones unduly the age at which practice begins. As a matter of fact, no medical school in this country has an absolute minimum requirement of more than three years of college work for entrance, and the majority of the first-class schools have only a two years' requirement.

Taking all things into consideration, it is the consensus of opinion that the requirement of two years of collegiate work for entrance best meets present conditions. This, it may be noted, is approximately equivalent to the entrance requirement for medicine in the leading European nations. An admirable solution of the problem of preliminary medical education is found in the "combined course" in Arts and Medicine, whereby it is possible to secure the A. B. degree and also the M. D. within six (or seven) years.

As to the character of the collegiate work preparatory to medicine, there is now a general agreement of opinion. The old idea that there exists an ideal college course, classical or otherwise, which prepares for any vocation is now abandoned. The present elective system makes it desirable for one to decide upon his future career as early as possible, and to plan his college course so as to prepare himself for the greatest possible efficiency in his life work. This doctrine is frankly utilitarian, but "useful" should here be interpreted in the wider, and not in the narrow "bread-and-butter" sense of the term. "Students of medicine, perhaps more than any other class of men, and certainly more now than ever before, must be broadly liberal in order to be minutely special."

What subjects, then, should the premedical college course include? First and foremost, it should be so planned as to give a thorough training in biology, especially zoology. Most of the accurate and useful knowledge we have concerning the laws of life is derived from careful study and experimentation upon lower forms of life. All living things are built up of similar units called cells. Each cell is composed of the living substance, protoplasm, and upon the physical and chemical changes therein depend the phenomena of life.

In order to understand the nature and conditions of life, it is therefore further evident that one must have a thorough knowledge of physics and chemistry. As time goes on, biology in general and

medicine in particular are based more and more upon the fundamental laws of physics and chemistry. Having laid a good foundation in physics, chemistry and zoology, the student is prepared for the more specialized biological sciences, anatomy, physiology and pathology; and these in turn lead up to the technical courses in clinical medicine.

Other sciences valuable for the medical student are botany and experimental psychology. Of mathematics, enough should be taken to facilitate the work in physics and chemistry. In languages, excepting an elementary knowledge of Latin (usually taken in the high school), French and German are most valuable. This is especially true of German, since a large proportion of the most important biological and medical work is published in that language. English, too, should not be neglected, for every physician should certainly understand the use of his mother tongue. Finally, a course in free-hand drawing is exceedingly useful in many ways.

The advantages of a premedical scientific college course as outlined above are well summarized by the following quotation (from the *Journal of the American Medical Association*, May 27, 1911): "As a part of the education which should be preliminary to the study of medicine, courses in physics, chemistry, biology and modern languages have been especially urged during the last several years by the Council on Medical Education. The importance of the sciences named does not depend so much on the bare knowledge obtained from them as on training the student receives. In the work in these sciences, and particularly in the laboratory work, the student, under able instructors, acquires the ability to think for himself; he develops the scientific spirit; he learns the use of the microscope and becomes acquainted with the methods and value of experimentation. A reading knowledge of French and German is an invaluable aid to the medical knowledge, a large portion of which appears in the languages named. That is the minimum preliminary education which should be insisted upon in this country, not because it is the minimum requirement in every other civilized nation, which is a fact, but because the student really needs that training in order to master the complex courses in the modern medical curriculum and to do his part in solving the intricate problems which now confront the medical world. In the medical course of today the ability of the student to think, to observe and to do research work is very essential. This was not so necessary twenty-five or thirty years ago. Experience has shown that the needed qualifications are best developed by thorough courses, under expert teachers, in physics, chemistry, biology and modern languages. These are the reasons for urging those courses as a part of the minimum requirement for admission to the medical schools in this country."

Medical Education.

Presupposing the preliminary college training as above outlined, the medical education proper may next be considered. What are the subjects included in the medical curriculum, and what facilities are necessary in order that they may be successfully taught? As

previously stated, medicine is an applied science. Broadly speaking, therefore, it is necessary first to master the subject matter, the fundamental medical sciences, and then to learn how to apply these in clinical medicine, in the prevention and cure of disease. Medical education therefore falls naturally into two subdivisions, the fundamental work occupying the first two years, and the clinical work the last two (or three, if a hospital year be added). Each of these periods will be considered briefly, following which some data will be cited whereby the relative merits of the various medical schools may be judged.

Fundamental Medical Education.

The fundamental sciences upon which medicine is directly based may be grouped under three headings. The first of these, the anatomical group, includes those which concern primarily the normal form and structure of the human body. These include gross anatomy (dissection, osteology, neurology, topographic anatomy, etc.), microscopic anatomy (histology) and developmental anatomy (embryology). The second, or physiological group, includes those studies which concern primarily the normal functions of the living organism. In this group, in addition to physiology in the narrower sense, we may place organic and physiological chemistry, and also pharmacology, which deals with the effects of drugs upon the normal organism. The third group, known as pathology (including bacteriology) deals with the abnormal conditions of structure and function which are associated with disease. Finally, there is the subject of hygiene and preventive medicine, which lies in the borderland between the fundamental sciences previously mentioned, and the succeeding subjects in clinical medicine.

It is impossible within the limits of this bulletin to discuss in detail the requisites necessary for thorough instruction in the fundamental sciences. Those desiring to look into this matter more fully are referred to a work entitled "A Model Medical Curriculum," a report of a committee of one hundred leading educators, issued by the Council on Medical Education of the American Medical Association, 535 Dearborn Ave., Chicago, Ill.

It may be noted briefly that the old-fashioned didactic method of teaching by lectures and recitations from books has been completely revolutionized and replaced by the laboratory method, whereby the student directly observes and studies the phenomena for himself. The laboratory method of instruction requires for success two essential factors. First and most important, the teachers in the various laboratory subjects must be thoroughly trained specialists, who are paid salaries to devote their entire time to this work, and are not allowed to practice medicine. They should moreover be active investigators whose enthusiasm will be an inspiration to their students. Too much emphasis cannot be laid upon "the man behind the gun." The second factor includes the facilities, buildings, equipment and materials for thorough work in each of the laboratories for the various fundamental medical sciences. These two factors, the full-time, thoroughly trained teachers and the numerous

well-equipped laboratories are so costly as to be out of the reach of most medical schools, but they are necessary in order to obtain the thorough laboratory instruction which is essential in modern medical education.

Another necessity, the importance of which is becoming more clearly recognized, is a good medical library. This should include several thousand well chosen volumes for reference, including files of one hundred or more of the leading medical periodicals of the world. A good medical library is also very expensive, but is necessary for the best work in instruction, and absolutely essential for research.

Clinical Medical Education.

When the student has completed the first two years of the curriculum and has mastered the fundamental medical sciences, he is familiar with the structure and functions of the human body, both normal and abnormal, and is ready to learn how to apply these principles at the bedside for the alleviation and cure of disease. This final period of medical education is designated clinical medicine. It includes two broad groups, internal medicine and surgery, each with numerous subdivisions. Here also lack of space prevents a discussion of each of the numerous special branches, for a full consideration of which the reader may consult the work "A Model Medical Curriculum" previously referred to. In passing, however, it may be remarked that for successful clinical teaching the essentials are very similar to those already stated for the laboratory sciences. The teachers should be skilled and experienced, each a recognized authority in his particular line. Here also it is highly desirable that salaries should be paid so that the teacher's whole time may be devoted to instruction and investigation, though very few schools are financially able to carry out this policy. The laboratory of the clinical work is the hospital, and it is essential for successful clinical work that each school should own or absolutely control the clinical facilities in a large hospital with a sufficient number of beds in each of the various clinical branches. Certain clinical laboratories must also be provided.

On account of the heavy expenses involved in providing salaried teachers, laboratory and hospital facilities, it is axiomatic that no school can depend solely upon students' fees for support. Private endowment or state support on a liberal scale is essential to provide medical education fully up to modern standards.

The minimum facilities considered absolutely necessary in order that a medical college may be able to give a satisfactory training up to modern standards in both fundamental and clinical subjects are, according to the Council on Medical Education of the American Medical Association, as follows:

Outline of the Essentials of An Acceptable Medical College.

1. Strict enforcement of all standards and requirements, the college itself to be held responsible for any instances where they are not enforced.

2. A requirement for admission of at least a four-year high

school education superimposed on eight years of grammar school work, as defined by the College Entrance Examination Board.

3. Beginning January 1, 1914, the minimum requirement for admission should be enlarged to include at least one year's college work each in physics, chemistry and biology and a reading knowledge of at least one modern language, preferably German or French.

4. A requirement that students be in actual attendance in the college within the first week of each annual session and thereafter.

5. That actual attendance at classes be insisted on except for good cause, such as for sickness, and that no credit be given under any circumstances for less than 80 per cent of attendance on each course.

6. That advanced standing be granted only to students of other acceptable colleges and that in granting advanced standing there shall be no discrimination against the college's full-course students.

7. Careful and intelligent supervision of the entire school by a dean or other executive officer who holds, and has sufficient authority to carry out, fair ideals of medical education as interpreted by modern demands.

8. A good system of records showing conveniently the credentials, attendance, grades and accounts of the students.

9. A fully graded course covering four years of at least 32 weeks each, exclusive of holidays, and at least 30 hours per week of actual work; this course should be clearly set forth in a carefully prepared and printed schedule of lectures and classes.

10. Two years of work consisting largely of laboratory work in thoroughly equipped laboratories in anatomy, histology, embryology, physiology, chemistry (inorganic, organic and physiologic), bacteriology, pathology, pharmacology, therapeutics and clinical diagnosis.

11. Two years of clinical work largely in hospitals and dispensaries, with thorough courses in internal medicine (including physical diagnosis, pediatrics, nervous and mental diseases), surgery (including surgical anatomy and operative surgery on the cadaver), obstetrics, gynecology, laryngology, rhinology, ophthalmology, otology, dermatology, hygiene and medical jurisprudence.

12. As soon as conditions warrant, a fifth undergraduate year should be required which should be spent by the student as an interne in an approved hospital.

13. At least six expert, thoroughly trained professors in the laboratory branches, salaried so that they may devote their entire time to instruction and to that research without which they cannot well keep up with the rapid progress being made in their subjects. These professors should have a definite responsibility in the conduct of the college, and their first and chief interest should be in the training of the medical students. There should also be a sufficient number of assistants in each department to look after the less important details. A suggested assignment of these instructors is (a) professor of anatomy, (b) professor of physiology, (c) professor of pathology and bacteriology and (d) professor of physiologic chemistry and pharmacology. The other two might be associate or

assistant professors and assigned one to the laboratory course in histology and embryology under the professor of anatomy and the other to the department of pathology and bacteriology.

14. The medical teaching should be of at least the same degree of excellence as obtains in our recognized liberal arts colleges and technical schools.

15. The faculty should be thoroughly organized and, with a few allowable exceptions, should be made up of graduates of institutions recognized as medical colleges and should have had a training in all departments of medicine. They should be appointed because of their ability as teachers and not because they happen to be on the attending staff of some hospital or for other like reasons.

16. The college should own or entirely control a hospital in order that students may come into close and extended contact with patients under the supervision of the attending staff. The hospital should have a sufficiently large number of patients to permit the student to see and study the common variety of surgical and medical cases as well as a fair number in each of the so-called specialties.

17. The college should have easily accessible hospital facilities of not less than 200 patients which can be utilized for clinical teaching (for senior classes of 100 students or less), these patients to represent in fair proportion all departments of medicine.

18. The college should have additional hospital facilities for children's diseases, contagious diseases and nervous and mental diseases.

19. Facilities for at least six maternity cases for each senior student, who should have actual charge of these cases under the supervision of the attending physician. Careful records of each case should be handed in by the student.

20. Facilities for at least 30 autopsies during each college session which are attended and can be participated in by senior students (for senior classes of 100 students or less).

21. A dispensary, or out-patient department, under the control of the college, the attendance to be a daily average of 60 cases (for senior classes of 100 students or less), the patients to be carefully classified, good histories and records of the patients to be kept and the material to be well used.

22. The college should have a working medical library to include the more modern text and reference books with the *Index Medicus* and 30 or more leading medical periodicals; the library room should be properly lighted and heated, and easily accessible to students during all or the greater part of the day; it should be equipped with suitable tables and chairs, and have a librarian in charge.

23. A working medical museum having its various anatomic, embryologic, pathologic and other specimens carefully prepared, labeled and indexed so that any specimen may be easily found and employed for teaching purposes. It is suggested that so far as possible with each pathologic specimen coming from post-mortems there also be kept the record of the post-mortem, the clinical history of the patient on whom the autopsy was held and microscopic

slides showing the minute structures of the disease shown in the gross specimen.

24. There should be sufficient dissecting material to enable each student individually to dissect at least the lateral half of the human cadaver; to provide cross-sections and other demonstration material and to allow of a thorough course for each senior in operative surgery on the cadaver.

25. A supply of such useful auxiliary apparatus as a stereopticon, a reflectoscope, carefully prepared charts, embryologic or other models, manikins, dummies for use in bandaging, a Roentgen-ray and other apparatus now so generally used in medical teaching.

26. The college should show evidences of thorough organization and of reasonably modern methods in all departments and evidences that the equipment and facilities are being intelligently used in the training of medical students.

27. A clear statement of the college's requirements for admission, tuition, time of attendance on the classes, sessions, courses offered and graduation should be clearly set forth, together with complete classified lists of its matriculants and latest graduating class in regular annual catalogues or announcements.

Criteria for Judging Schools.

Having in mind the essential elements involved in a thorough premedical and medical education, it devolves upon the prospective student to select the school which he will attend. This is a critical problem, and grave mistakes are often made through lack of knowledge regarding the various schools. With regard to the premedical college work, the problem is less difficult, but it is essential to choose a college well equipped for teaching the fundamental sciences of biology, physics and chemistry. In general, these are best taught in the stronger universities, such as those in the Association of American Universities.*

In choosing a school for the medical curriculum proper, the problem is much more complicated. There are in the United States about 120 medical colleges, good, bad and indifferent, whose relative merits it is difficult for the student to judge. Bearing in mind the essential principles previously outlined, the most important information desirable is indicated in the following questions:

1. As to organization, is it an independent medical school, or an integral (not merely nominal) department of a strong university?
2. What is the amount of the income and expenditure? Is the income dependent solely upon students' fees, or is it supported liberally by endowment or state appropriations?
3. What is the extent and character of the laboratory and clinical facilities, its buildings, equipment, library, etc.?

* This Association includes the following universities: California, Catholic University, Chicago, Clark, Columbia, Cornell, Harvard, Illinois, Indiana, Iowa, Johns Hopkins, Kansas, Michigan, Minnesota, Missouri, Nebraska, Stanford, Pennsylvania, Princeton, Virginia, Wisconsin and Yale.

4. What is the character of the faculty? Are the teachers full-time salaried experts, or are they allowed to engage in the private practice of medicine? To what extent are they contributing to the advancement of medical science by original research?

5. Do the entrance requirements include a minimum of two years of college work, and are they strictly enforced?

6. What is the character of the curriculum, stress laid upon practical work in laboratory and clinics, opportunity for research, etc.?

7. Are the classes large, or are they small, allowing individual attention to each student?

8. What are the tuition fees and expenses?

9. What is the general standing of the school, its rating by competent and disinterested organizations, and its efficiency as measured by the results of the examination of its graduates before the various State licensing boards?

Where to Find Information.

Where can the prospective student find reliable data in answer to the preceding questions? Much can of course be learned from the catalogues of the various schools, but in many cases it must be confessed that the information contained therein is incomplete, and even misleading. It may therefore be of service to those interested in this matter to know where to find reliable data from disinterested sources.

In the first place, a list of the medical schools of the United States together with brief information (furnished, however, by the schools themselves) is published in the chapter on "Professional Schools" in the annual report of the Commissioner of Education, U. S. Bureau of Education, Department of the Interior, Washington, D. C. A reprint of this chapter is obtainable and is useful for reference.

Similar information, which is more complete in some respects, is published each year during August in the "Educational Number" of the Journal of the American Medical Association (Chicago).

The Council on Medical Education of the A. M. A. has made a thorough personal inspection and investigation of the various medical schools of the country, and has rated them in four classes: Class "A plus" colleges are those which are acceptable (25 colleges); class "A," those which need improvement in certain respects, but which are otherwise acceptable (41 colleges); class "B," those which, under their present organization, might be made acceptable by general improvements (24 colleges); and class "C," those which require a complete reorganization to make them acceptable (29 colleges).

Another basis for judgment is to be found in the membership of the Association of American Medical Colleges, with about 50 schools, including nearly all of the better class. A list of the members is published annually in the Educational Number of the Journal A. M. A. above referred to, or may be obtained from the Secretary, Dr. F. C. Zapffe, 3431 Lexington St., Chicago, Ill.

Information showing the percentage of failures of graduates of the various schools in examinations before the different state licensing boards is published annually in the "State Board Number" of the Journal A. M. A. (Chicago). The most recent issue of this number was issued in May, 1913. Those interested especially in Missouri schools will find considerable information in the report of the State Council on Medical Education, published in the February, 1913, number of the Journal of the Missouri State Medical Association (St. Louis). A similar report is published each year.

By far the most full, frank and instructive account of the medical situation is to be found in the bulletin entitled "Medical Education in the United States and Canada; a Report to the Carnegie Foundation for the Advancement of Teaching by Abraham Flexner." This is a large volume (346 pages) published in 1910, and may be obtained by sending 17 cents for postage (address: 576 Fifth Ave., New York City). This report is divided into two parts. The first part deals with the general principles of medical education, ideals versus present conditions, organization and equipment of medical schools, course of study, medical sects, etc. The second part gives a detailed and critical account of the various schools, including the defects as well as the good points of each. This report, which is based upon an actual inspection of each school, will be found exceedingly instructive and useful to all interested in medical education.

A later report, published in 1912 by the Carnegie Foundation, deals with a comparative study of medical education in the leading European countries.

THE SCHOOL OF MEDICINE.

In the foregoing pages the profession of medicine has been considered with especial reference to the principles underlying sound medical education, and the facilities necessary according to modern standards. Attention is now called to the School of Medicine of the University of Missouri, and to the advantages which it offers in providing facilities for obtaining at low cost both premedical and medical education measuring up to the high standards previously outlined.

Aim of the School of Medicine.

The aim of the School of Medicine is threefold:

(1) To give a thorough laboratory training in those scientific subjects which are fundamental to medicine and form an indispensable preparation for the clinical work.

(2) To contribute to the advancement of medicine by original investigation in the various sciences upon which modern medicine is based.

(3) To promote the diffusion of medical knowledge among the citizens of the State. For this special purpose, the department of Preventive Medicine has recently been established.

PREVENTIVE MEDICINE.

The purpose of this department is to present to the people of

the State the well established medical facts pertaining to the prevention of infectious diseases, and to assist, so far as is possible, the general advancement of medicine. Teaching of the masses can best be accomplished in the grade schools, high schools, etc., and by the newspapers. Courses in preventive medicine are offered in the University each semester and in the Summer Session especially to teachers and to students in journalism. These courses are also open to all students in the University interested in preventive medicine.

A bureau of information has been established, which upon request furnishes to the citizens of Missouri information pertaining to practical points regarding the prevention of infectious diseases. A laboratory for clinical pathology will also soon be established. The services of the bureau of information and the laboratory will be free of charge to all citizens of Missouri.

The bureau of information is intended to give immediate assistance to the people while the more thorough but slower method of instruction in preventive medicine is being established in the various schools. To illustrate: it is known that a patient just recovering from typhoid fever is for several months heavily infected with typhoid bacilli and is during this time a source of infection. The feces of such a patient should be examined from time to time to determine when free from typhoid bacilli. Until free, the fecal matter should be disinfected. On account of the expense this procedure is practically never carried out. The bureau of information and laboratory will attempt to perform these services and similar work along other lines free of charge, with the hope that some progress in the prevention of infectious diseases may be made along practical lines.

In order further to disseminate information in the field of preventive medicine, a Medical Series of the University of Missouri Bulletin has been established. These bulletins are illustrated and popular in character, and as thorough and practical as possible. They are published quarterly and mailed free upon request. Two numbers have already been issued: No. 1, "Bacteria and Disease" by Prof. O. W. H. Mitchell; and No. 2, "Prevention of Typhoid Fever," by Prof. W. J. Calvert. Soon to be issued are No. 3, "Prevention of Contagious Diseases in School Children," by Prof. W. J. Calvert; and No. 4, "Eye, Ear, Nose and Throat Troubles in School Children," by Dr. Guy L. Noyes.

HISTORICAL STATEMENT.

The Medical Department of Kemper College ("McDowell Medical College"), founded in St. Louis in 1840, was the first medical school established west of the Mississippi River. In 1845 this school became the Medical Department of the University of Missouri. In 1855, however, it was discontinued; but was re-established in Columbia in December, 1872. The curriculum was at first only two years in length, but was extended to three years in 1891, and to the full four years in 1899.

Owing to the limited clinical facilities at present, the last two (clinical) years of the medical curriculum have been temporarily suspended. A plan for the establishment of a general State Hospital

has been adopted by the University, and the clinical portion of the work will be resumed as soon as it is practicable to establish it with adequate clinical facilities. In the meantime, the first two years of the medical curriculum will be continued at Columbia and still further strengthened. On the completion of this work a certificate is given which will admit the student to advanced standing with full credit in other medical schools, where the clinical work of the last two years may be completed.

The School of Medicine has always stood for the highest standards of medical education, and was a pioneer in introducing and developing the laboratory method. Laboratory work in anatomy, chemistry, and microscopy was required of students from the date of re-establishment in 1872. A few years later laboratory work in pathology and in physiology was added, and in 1891 the laboratories of histology and bacteriology were established. The School of Medicine of the University of Missouri was also one of the first schools to place these fundamental medical sciences in charge of specialists who are not allowed to practice medicine, but devote their time exclusively to teaching and investigation.

Organization and Support.

As has been previously emphasized, the nature of the organization and support of a medical school is a matter of primary importance. The Medical School of the University of Missouri is an integral part of the University, whose total income from all sources is about \$850,000 a year. The Medical School is supported from this income, about \$30,000 being expended annually for this purpose (including Hospital), while less than \$3,000 is collected in fees from the medical students.

As a result of this liberal support, it has been possible for many years to organize and maintain the medical work on a proper University basis. The faculty is composed of eminent specialists, who are not allowed to engage in the practice of medicine, but devote their entire time to teaching and investigation. The course of study is carefully planned, modern laboratory methods being used throughout. The high standards of admission result in small classes (not over twenty-five in each) prepared for the highest type of work. Women are admitted on equal terms with men.

In the following pages, more detailed information will be given concerning the faculty, the buildings and equipment, and the courses of study. As already stated, the character and training of the faculty is a matter of the greatest importance, and some brief information upon this topic is therefore included with the following list of the members of the Medical Faculty.

FACULTY OF THE SCHOOL OF MEDICINE.

ALBERT ROSS HILL, A. B., Ph. D., LL. D.,

President of the University and Professor of Educational Psychology.

A. B., Dalhousie University, 1892; Scholar in Philosophy, Cornell University, 1892-3; Student at Heidelberg, Berlin, and Strassburg

University, 1893-4; Fellow in Philosophy, Cornell University, 1894-5; Ph. D., Cornell University, 1895; Student in Clark University, Summer of 1896; LL. D., University of South Carolina, 1905, Dalhousie University, 1908, and Westminster College, 1909; Professor of Psychology and Education, State Normal School, Oshkosh, Wisconsin, 1895-7; Associate Professor of Philosophy, University of Nebraska, 1897-8; Professor of Philosophy and Director of Psychological Laboratories, 1898-1903; Head of the Department of Education, University of Missouri, 1903-4; Professor of Educational Psychology, and Dean of the Teachers College, 1904-07; Professor of Philosophy of Education, Director of the School of Education, and Dean of the College of Arts and Sciences, Cornell University, 1907-08; Present position, 1908-.

CLARENCE MARTIN JACKSON, B. S., M. S., M. D.,

Professor of Anatomy and Histology, and Dean of the Faculty.

B. S., University of Missouri, 1898, M. S., 1899, M. D. 1900; Student, University of Leipzig, 1903-4; University of Berlin, 1904; Fellow in Biology, University of Missouri, 1897-9; Instructor in Anatomy, 1899-1900; Assistant Professor (in charge) of Anatomy and Histology, 1902-, Junior Dean of the Faculty of Medicine, 1906-09; present position, 1909-.

SIDNEY CALVERT, B. Sc., A. M.,

Professor of Organic Chemistry.

B. Sc., McGill University, 1890; Graduate Student, Harvard University, 1890-4, A. M., 1892, Assistant in Chemistry, 1892-4, Private Research Assistant, 1892-4; Assistant in Chemistry, Harvard Summer School, 1894; Student, University of Freiburg, 1901-2; Assistant Professor of Chemistry, University of Missouri, 1894-1902, Assistant Professor of Organic Chemistry, 1905-06; present position, 1906-.

WILLIAM JEPHTHA CALVERT, A. B., M. D.,

Professor of Preventive Medicine.

A. B., University of Kentucky, 1893; M. D., Johns Hopkins Medical School, 1898; 1st Lieutenant and Assistant Surgeon, U. S. Army, 1899-1902; In charge of the Laboratory of Board of Health, Manila, P. I., 1900-01; Lecturer on Tropical Diseases, Washington University, St. Louis, 1902-03; Assistant Professor of Internal Medicine, University of Missouri, 1903-08; Professor of Physical Diagnosis and Clinical Pathology, 1908-09; Professor of Internal Medicine, Baylor University, 1909-11; present position, 1911-.

DAVID HOUGH DOLLEY, A. B., A. M., M. D.,

Professor of Pathology and Bacteriology.

A. B., Randolph-Macon, 1897, A. M., 1898; M. D., Johns Hopkins Medical School, 1902; Resident Pathologist, St. Vincent's Charity Hospital, 1902-3; Assistant Demonstrator of Pathology, Western Reserve University, and Resident Pathologist, Lakeside Hospital, Cleveland, 1903-4; Professor of Histology and Pathology, University of North Carolina, 1906-10; present position, 1910-.

CHARLES WILSON GREENE, A. B., A. M., Ph. D.,
Professor of Physiology and Pharmacology.

A. B., Leland Stanford Jr. University, 1892, A. M., 1893; Ph. D., Johns Hopkins University, 1898; Instructor in Physiology, Leland Stanford Jr. University, 1893-8, Assistant Professor, 1898-1900; Instructor in Zoology, Marine Biological Laboratory, 1896 and 1897, in Physiology, 1900; Fellow in Physiology, Johns Hopkins University, 1897-8; Temporary Assistant, U. S. Bureau of Fisheries, 1901-; present position, 1900-.

GEORGE LEFEVRE, A. B., Ph. D.,
Professor of Zoology.

A. B., Johns Hopkins University, 1891, Fellow, 1894-5, Bruce Fellow, 1895-7, Ph. D., 1896; Assistant in Zoology and Embryology, 1897-8; Instructor in Zoology, Marine Biological Laboratory, Woods Hole, Mass., 1898-9; Member of Staff of Investigation, 1906-; Temporary Assistant, U. S. Bureau of Fisheries, 1907-; present position, 1899-.

WOODSON MOSS, M. D., LL. D.,
Professor of Principles of Medicine, and University Physician.

M. D., University of Missouri, 1874, LL. D., 1901, Instructor in Medicine and Demonstrator of Anatomy, 1875-8; Professor of Anatomy and Demonstrator, 1878-83; Professor of Anatomy and Physiology, 1883-91; studied in Europe, 1890; Professor of Anatomy and the Practice of Medicine, University of Missouri, 1891-1900, Tutor to the University, 1906-; Professor of the Practice of Medicine and Therapeutics, 1900-09; present position, 1910-.

GUY L. NOYES, M. D.,
Superintendent of the Parker Memorial Hospital.

M. D., University of Vermont, 1894; M. D., University of Michigan, 1901; House Surgeon, Mary Fletcher Hospital, 1895; First Assistant Physician, Northern Michigan Asylum, 1896-1900; Assistant in Ophthalmology, 1901, Demonstrator of Ophthalmic and Aural Surgery, University of Michigan, 1902; Harvard University Medical School, Summer Session, 1905; Professor of Diseases of the Eye and Ear, University of Missouri, 1902-09; present position, 1906-.

OLIVER WENDELL HOLMES MITCHELL, M. D.,
Associate Professor of Pathology and Bacteriology.

M. D., University of Missouri, 1908, Student Assistant in Pathology and Bacteriology, 1906-8, Assistant in Pathology and Anaesthetist to Parker Memorial Hospital, 1908-09; Student and Laboratory Assistant in Pathology, Rush Medical College, 1909; Instructor in Pathology and Bacteriology, University of Missouri, 1909-10; Assistant Professor of Pathology and Bacteriology, 1910-13; present position, 1913-.

FRANKLIN PARADISE JOHNSON, A. B., A. M., Ph. D.,
Assistant Professor of Anatomy.

A. B., University of Missouri, 1908; A. M., Harvard University, 1910, Ph. D., 1912; Student, University of Freiburg, Summer, 1911; Student Assistant in Anatomy, University of Missouri, 1907-8; Austin

Fellow in Histology and Embryology, Harvard University, 1908-10, Instructor in Histology and Embryology, 1910-12; present position, 1912-.

ADDISON GULICK, A. B., A. M., Ph. D.,
Assistant Professor of Physiology.

A. B., Oberlin College, 1904; A. M., Harvard University, 1905; Ph. D., University of Wuerzburg, 1910; Teaching Fellow in Biochemistry, University of Toronto, 1910-11; Instructor in Physiological Chemistry, University of Minnesota, 1911-12; Instructor in Physiology, University of Missouri, 1912-13; present position, 1913-.

GEORGE WASHINGTON TANNREUTHER, A. B., A. M., Ph. D.,
Instructor in Zoology.

A. B., Manchester College, 1900; A. M., Antioch College, 1901; Ph. D., University of Chicago, 1908; Laboratory Assistant in Zoology, 1904; Fellow in Zoology, 1904-05; Assistant in Zoology, University of Missouri, 1905-09; present position, 1909-.

THOMAS JOHANNES HELDT, A. B., A. M.,
Assistant in Anatomy.

A. B., University of Missouri, 1910, A. M., 1912; present position, 1910-.

ALBERT LESTER JONES, B. S.,
Assistant in Pathology.

B. S., Baylor University, 1909; present position, 1912-.

THEOPHILE KARL THEODORE KRUSE, A. B.,
Assistant in Physiology.

A. B., University of Missouri, 1912; present position, 1912-.

JAMES ROBERT McVAY, A. B.,
Assistant in Physiology.

A. B., University of Missouri, 1912; present position, 1912-.

MARTIN DANIEL OTT, A. B.,
Student Assistant in Anatomy.

A. B., Central Wesleyan College, 1910; present position, 1912-13.

BUILDINGS AND EQUIPMENT.

Next to the faculty, among the factors which determine the efficiency, come the buildings and material equipment. The School of Medicine is located upon the same campus with the other divisions of the University. Of the various buildings (over twenty) on the campus, a group of three—the Medical Laboratory Building, the Animal House, and the Parker Memorial Hospital,—are devoted primarily to the School of Medicine. These will be described in some detail. Several other buildings (Chemistry, Zoology, etc.) are also utilized in part for medical instruction.

Medical Laboratory Building.

This is a new stone and brick building, 48x150 feet, three stories high. It was especially designed for the medical laboratories, and

is well equipped to meet the needs of modern laboratory instruction and research. The following is a brief list of the various rooms and equipment in this building.

The department of anatomy and histology occupies (1) a large dissecting room, well lighted and ventilated, with dissecting tables, students' lockers, display cases for specimens, models, etc.; (2) an advanced anatomical laboratory, specially equipped for the study of topographic anatomy, including serial sections through formalin hardened bodies; (3) histological laboratory (with preparation and store-room in connection), thoroughly equipped with lockers, tables, microscopes, microtomes, and other apparatus for instruction and research in microscopic work; (4) lecture room for anatomy and histology, equipped with Auzoux manikin, projection apparatus, charts, etc.; (5) museum and study room, with adjacent preparation room, containing a large number of models and specimens in human anatomy; (6) professor's office; (7) research laboratory; (8) embalming and storage rooms, with an abundance of well-preserved cadavers for the work in dissection.

The department of physiology, physiological chemistry, and pharmacology occupies the following rooms: (1) A large laboratory (with adjoining store-room) equipped with tables, lockers, and sets of apparatus for the students in physiology and pharmacology; (2) a blood-pressure room, particularly for mammalian experiments; (3) a research laboratory, thoroughly equipped, for advanced students in physiology and pharmacology; (4) professor's office, with adjacent research laboratory; (5) professor's office and research laboratory in physiological chemistry; (6) large students' laboratory with adjacent store-room, thoroughly equipped for work in physiological chemistry; (7) animal room; (8) mechanic's shop; (9) lecture room (in common with pathology).

The department of pathology and bacteriology occupies (1) a large students' laboratory for bacteriology and pathological histology, well equipped with lockers, microscopes with oil immersion lenses, etc.; (2) a preparation room for bacteriology, with sterilizers, incubators, etc.; (3) private laboratory, well equipped for research work in pathology; (4) office for pathology; (5) room for autopsies and work in gross pathology; including a collection of pathological specimens in glass cases; (6) an animal room and store-room; (7) office and research laboratory for bacteriology; (8) lecture room (in common with physiology); (9) laboratory room for work of preventive medicine.

Medical Library.

No medical school of today can be considered well equipped without a good library. The Medical Library is placed in a room on the upper floor of the Medical Laboratory Building, and is open eight hours daily, except Sunday. It contains about 5000 bound volumes, and a large number of pamphlets. The principal medical works of reference are included and the leading medical periodicals of the world (about 100 in number) are received regularly and placed

on file. Complete sets of most of these journals are available. The main University Library also contains many works of interest and value to the medical sciences.

A complete catalogue of the books and periodicals in the Medical Library will be furnished free by the University Librarian upon request. The journals and books in the Library will be lent free to any reputable physician of the State. The borrower is required to pay the transportation charges both ways.

Provision is also made for sending out circulating libraries to county medical societies arranged in circuits. For information, address the University Librarian, or the Dean of the School of Medicine.

Animal House.

The animal house is located near the Medical Laboratory Building. It is a brick structure, well lighted, heated and ventilated, with plumbing and other conveniences. This building provides excellent facilities for rearing and preserving animals, and for investigations in the various lines of medical science. It is of especial value for the experimental work in physiology, pathology and bacteriology.

Other Buildings.

In several other buildings on the University campus (chemistry, zoology, etc.), instruction is offered in many lines open to medical students as electives, and of especial service to those taking the combined course in Medicine and in Arts and Science. The Gymnasium and athletic grounds are open for the use of all students, and special opportunities are offered to those interested.

THE PARKER MEMORIAL HOSPITAL

Guy L. Noyes, M. D.....Superintendent
Frances Shouse, R. N.....Principal of Training School for Nurses

By the gift of Mr. Wm. L. Parker, the University has an excellent Hospital, which has now been in operation for 12 years. In the words of the donor, the Hospital is "for the benefit of the School of Medicine." The building is a handsome, modern structure, conveniently located on high ground at the west side of the campus.

A surgical amphitheatre adjoining the Hospital has been provided by the gift of Mr. Adolphus Busch, of St. Louis. It is supplied with accessory rooms for sterilizing, anaesthetizing, etc.

The Parker Memorial Hospital is owned and operated by the University primarily for the benefit of the University students. It is also open to the sick of Missouri for the treatment of acute and chronic curable diseases. Those who suffer from chronic incurable, or dangerous communicable diseases, are not admitted to the Hospital.

Patients are admitted to the Hospital at any hour of the day. Those living outside of Columbia should make application in advance for admission, preferably through their family physician, who should send with the application for admission a brief statement concerning the nature of the patient's illness.

Application for admission should be addressed to the Superintendent of the Hospital.

Lectures and demonstrations are given from time to time in the Hospital for the benefit of the students of medicine and the nurses in training.

Rates and Terms.

The following rates are for the maintenance of patients who are not students of the University, including bed, board, and general nursing:

General Medical and Surgical Cases. Single rooms, \$15.00 a week and upward. Wards, \$10.00 a week and upward.

Obstetrical Cases, \$25.00 a week.

Special Nursing, by pupil nurses, may be had at the rate of \$3.00 a day.

Extra Fees will be charged for medicines, dressings, and the use of the operating room or its equipment. Fees for maintenance are payable invariably in advance.

Physicians who hold consultation with or give treatment to patients not resident in the Hospital, and require therefore the attendance of a nurse or the use of the equipment of the Hospital, must pay a minimum fee of \$1.00 for such privilege.

Students of the University of Missouri, regularly enrolled as such are (with certain exceptions) given free Hospital care. Those who can afford to do so are expected to pay for medical services.

The University Physician gives free medical advice and service to students of the University only, in his office at the Hospital, where he may be seen at regular daily hours, which are announced at the beginning of each school year.

The Training School for Nurses.

The School for Nurses of the University of Missouri was organized in 1901. The school is conducted in connection with the Parker Memorial Hospital.

Pupil nurses receive their training in the Hospital and laboratories of the University. Nurses have access to the libraries and museums of the University at all times.

The course of instruction is thorough and familiarizes the pupils with the theory and practice of nursing in all its details. The course covers a period of three years of twelve months each. The first three months of residence in the school are probationary, and at the expiration of that time the pupil is regularly enrolled as a member of the School, provided she is found to be acceptable.

Beginning in the fall of 1913, the plan of instruction in the Training School will be changed. Teaching of the laboratory subjects, such as anatomy, physiology, bacteriology, hygiene, dietetics, etc., will be done in the first six months of the three years' course. During this period, which is known as the "Preliminary Term," nurses will not reside in the Hospital. They must engage room and board in houses approved by the Training School. The registration fee will be \$5.00.

A special announcement giving detailed information concerning

the Training School for Nurses will be sent in response to requests for the same, addressed to the Principal of the Training School for Nurses, Parker Memorial Hospital, University of Missouri, Columbia, Missouri.

Medical Curriculum.

FIRST YEAR.	Semester credits		Total hours	
	1st Sem.	2nd Sem.	Lecture.	Laboratory
Dissection	6	6	34	425
Normal Histology	4	4	34	204
Organic Chemistry	3	3	68	85
Vertebrate Embryology .....	.....	3	17	68
Neurology	3	.....	17	68
Totals	16	16	170	850
SECOND YEAR				
Topographic Anatomy .....	.....	2	.....	85
Physiology and Physiological Chemistry	12	.....	85	297
Pharmacology .....	.....	4	34	85
Pathological Bacteriology	4	.....	34	85
Pathology .....	.....	8	17	297
Hygiene .....	.....	3	51	.....
Principles of Medicine.....	1	1	.....	104
Totals	17	18	221	953

The work above outlined in the regular medical curriculum provides a thorough training in the various subjects usually included in the first two years of medicine. It meets the requirements of the Association of American Medical Colleges (of which this School is a member) and follows closely the ideal courses in the laboratory subjects recommended by the Council on Medical Education of the American Medical Association. The individual courses are described in detail on the following pages.

Courses in Detail.

Courses preceded by number with the letter a attached, thus: 100a, are give the first semester only. Those preceded by a number with the letter b attached, thus: 100b, are given the second semester only. Those preceded merely by a number are continuous courses

and are given both semesters. The number of hours' credit given for a course for each semester is indicated by the Arabic numerals following the statement of the course. Courses numbered 200 and above are strictly graduate in character.

For schedule of days and hours, application should be made to the Registrar after August 1.

ANATOMY AND HISTOLOGY.

102. **Dissection.** This course includes the dissection and gross anatomy of the entire human body, excepting the central nervous system and the sense organs. For use in the study of osteology, which is correlated with the work of dissection, a complete disarticulated human skeleton is issued to every two students. Fee for use of the skeleton, \$2.00 (deposit of \$10.00 required). Laboratory fee in addition, \$14.00. First Year. (6). Mr. Jackson; Mr. Heldt.

103. **Normal Histology.** A study of the microscopic anatomy of the body. A loan collection of sections is issued to each student for study. Each student also prepares, stains and mounts permanently additional specimens for study. Laboratory fee, \$3.50 each semester. First Year. (4). Mr. Johnson.

104a and 104b. **Neurology.** A study of the central nervous system and sense organs. Laboratory, with one lecture a week. Laboratory fee, \$3.50. First Year. (3). Mr. Johnson.

105b. **Topographic Anatomy.** A study of the topography of the various organs by means of serial sections through the entire body. Laboratory fee, \$4.50. Second Year. (2). Mr. Jackson.

206. **Advanced Anatomy, Histology or Embryology.** The amount and character of the work will be varied to suit individual needs. This course is open only to students who have had the elementary courses in anatomy, histology, or embryology. Laboratory. Elective. Mr. Jackson; Mr. Johnson.

207. **Research.** Problems will be assigned to students prepared for investigation in anatomy, histology or human embryology. A reading knowledge of German is required, and a reading knowledge of French is very desirable. In connection with this course, a seminary is held once a week, at which reports on current literature and research work in progress are discussed. Elective. Mr. Jackson; Mr. Johnson.

CHEMISTRY.

111. **Organic Chemistry.** The aim of this course is to give a general survey of the principal classes of organic compounds, such as hydrocarbons, alcohols, phenols, ethers, aldehydes, acids, esters, fats, carbohydrates, etc. In so far as it is possible, the student prepares in the laboratory representatives of the various classes of compounds and studies their reactions. Two lectures and one laboratory period a week. Laboratory fee, \$6.25 to \$7.25 (a deposit of \$10 is required). First Year. (3). Mr. Sidney Calvert.

For other courses in chemistry, which may be elected, see courses in chemistry, College of Arts and Science.

MEDICINE.

1. **Principles of Medicine.** In this course physical diagnosis is taught, and the principles of medicine and therapeutics are illustrated by means of a general medical clinic held at the Parker Memorial Hospital three times a week. Second Year. (1). Mr. Moss.

PATHOLOGY AND BACTERIOLOGY.

102a. **Pathological Bacteriology.** (Prerequisite, Botany 3a or 3b). In the laboratory work all the important species of pathogenic organisms are supplied for individual study. In addition, practical instruction is given in the bacteriological examination of pathological exudates and of water, milk, etc. The lectures, along with the consideration of biological characteristics, are aimed to be introductory to general pathology. Two lectures and two laboratory periods a week. (4). Second Year. Mr. Dolley; Mr. Mitchell; Mr. Jones.

103b. **Pathology and Pathological Anatomy.** This is essentially a laboratory course, supplemented by lectures and recitations, for the histological study of the general and special manifestations of disease. Each student is supplied with about three hundred sections which become his property. The corresponding gross material is afforded by a well equipped museum and by autopsies. Students assist in rotation at autopsies and are required to report independently in the customary form on their findings. Eight laboratory periods a week, including the lectures. Second Year. (8). Mr. Dolley; Mr. Mitchell; Mr. Jones.

201. **Advanced Pathology.** (Prerequisite, courses 102, and 103b). Choice may be made of either medical bacteriology or pathological anatomy. The amount and character of the work will depend upon the needs and qualifications of the student. In connection, opportunity will be afforded for practical experience in the handling of all kinds of morbid material. Hours to be arranged. Mr. Dolley; Mr. Mitchell. Elective.

202. **Research.** Opportunity is afforded to students sufficiently prepared for original investigation of unsolved problems in the fields of bacteriology, pathology and pathological physiology. A reading knowledge of German is required and one of French is recommended. A seminary is held once a week. Elective. Mr. Dolley.

203. **Normal and Abnormal Neuro-cytology.** The application of the general principles and theories of biology to the nerve cell in health and disease. The work will necessarily consist largely of original investigation and will be adjusted to the training of the student. Hours to be arranged. Elective. Mr. Dolley.

PREVENTIVE MEDICINE.

1a and 1b. **Preventive Medicine.** This course includes the general principles of personal and public health, and of the application

of preventive measures against disease. Open as an elective to the students of all Divisions of the University. (No medical credit.) Lectures and demonstrations. (2). Mr. W. J. Calvert. Elective.

101b. **General Hygiene.** (Prerequisite, Pathological Bacteriology, 102a). This course deals in a more detailed manner with the fundamental principles of public and personal hygiene and with the regulatory measures directed toward the improvement of general health as needed by physicians and public health officers. Three lectures a week. Second Year. (3). Mr. W. J. Calvert.

PHYSIOLOGY AND PHARMACOLOGY.

102a. **General Physiological Chemistry.** The physiology and physiological chemistry of the proteins; of muscle, nerve, and connective tissues; of the cells; of blood, secretions, digestion, absorption, intermediary metabolism, and excretion; of nutrition, heat production, and heat regulation. A metabolism experiment with a quantitative examination of the urine is required. Lectures and Laboratory. Second Year. (6). Mr. Gulick; Mr. Kruse.

103a. **Experimental Physiology.** The physiology of muscle and nerve, circulation, respiration, nervous system and sense organs. Lectures and laboratory. Second Year. (6). Mr. Greene; Mr. McVay.

105b. **Experimental Pharmacology.** This course presents the physiological action of drugs from the experimental point of view. The demonstrations are made on man and the lower animals. Second Year. (4). Mr. Greene; Mr. McVay.

208. **Journal Club.** (1). Mr. Greene. Elective.

210. **Advanced Physiology.** Advanced courses in physiology, physiological chemistry and pharmacology. Individual problems will be assigned to students of sufficient preparation. Hours to be arranged. Mr. Greene; Mr. Gulick. Elective.

211. **Investigation.** Opportunity is offered for research in questions of current interest in either of the fields represented. Mr. Greene; Mr. Gulick. Elective.

ZOOLOGY.

100a. **Embryology of Vertebrates.** The course is designed to lay the foundation of vertebrate embryology. Successive stages in the development of the frog, the chick and the pig are studied from preparations of entire embryos and from serial sections. These observations are used as a basis of comparison for the study of human embryology. Laboratory fee, \$4.50. (3). First Year. Mr. Lefevre; Mr. Tannreuther.

For comparative anatomy, cytology and other courses in zoology open to medical students as electives, see announcement under College of Arts and Science.

ELECTIVES.

Courses in botany, psychology, zoology, etc., may be elected by students in the School of Medicine who are prepared to pursue them.

See announcement of the College of Arts and Science. With the consent of the Dean, medical students may take any accessory work offered in other departments of the University.

MEDICAL CERTIFICATE.

On completing the work outlined in the regular medical curriculum, the student is awarded a Medical Certificate at the following commencement. This Certificate will admit him, with full credit for the first two years of medicine, to the leading medical schools, where abundant clinical facilities are available for the last two years' work. Care should be taken, however, to meet the detailed entrance requirements for the particular school chosen.

There is no disadvantage in thus changing to a new place for the clinical work, for there is a natural break in the medical curriculum at this time. Reason and experience agree that the first two years should be devoted exclusively to the fundamental medical sciences. For this work, thoroughly equipped laboratories are necessary. The student is unprepared for clinics, which at this time are apt even to constitute a harmful distraction. At the beginning of the third year, however, the medical student enters upon his clinical work, a new phase of the subject with different teachers, whether in the same or a different school.

ENTRANCE REQUIREMENTS.

The requirements for admission to the School of Medicine include:

(1) Fifteen units of secondary school work, including at least 3 units of English, 1 of Algebra, 1 of Plane Geometry, 2 of Latin, the remaining being elective. For further details, see general catalogue of the University.

(2) Two years (60 hours credit) of college work, including English, 5 hours; German, 5 hours; General Zoology, 5 hours; General Physics, 5 hours; Inorganic Chemistry, 5 hours; elective, 35 hours. Equivalent work in foreign language may be substituted for the English and German.

COMBINED WORK IN ARTS AND MEDICINE.

Students who have completed the secondary school work, as above outlined, but not the college work, are advised to enter the College of Arts and Science of the University to secure this work.

By the proper choice of electives in the College of Arts and Science, students may within four years complete the two years' college work required for admission, do the two years' work in Medicine, and at the same time meet the requirements for the degree of Bachelor of Arts. Such students are registered during the first two years in the College of Arts and Science only. During the last two years, however, they must register both in the School of Medicine and in the College of Arts and Science and must meet the requirements of both. Students are recommended to elect the subjects required, or which lead up to subjects required in Medicine, in approximately the order suggested by the following tabulated

statement. The work outlined for the first and second years includes all the college work which is required for entrance to the regular medical curriculum.

The entrance requirements for the combined curriculum outlined below is that specified for the College of Arts and Science, i. e., a high school course equivalent to fifteen units. A student who follows this curriculum will, at the end of four years, have completed the requirements for the A. B. degree. He will also have completed the two years' work in Medicine, and will require only two years more (or six years in all) for the M. D. degree. Students who wish to do more than the required amount of premedical collegiate work may extend the time to the amount desired. All students who contemplate taking this work should consult the Dean of the School of Medicine.

**CURRICULUM LEADING TO THE DEGREES OF A. B. AND
M. D. RECOMMENDED BY THE MEDICAL FACULTY.**

	First Semester. Hours Credit.	Second Semester. Hours Credit.
FIRST YEAR		
English	3	3
Elective	3	2
General Zoology (1a).....	5	0
Chemistry, Inorganic and Analytical.....	5	5
General Physics (2b)	0	6
Physical Training or Military Science.....	0	0
	16	16
SECOND YEAR		
Chemistry, Organic	3	3
Embryology of Vertebrates	3	0
*Ancient Language	5	0
*History	0	5
*Psychology and Logic.....	5	0
German	0	5
General Bacteriology	0	3
Physical Training or Military Science.....	0	0
	16	16
THIRD YEAR		
(Same as First Year of regular Medical Curriculum, with electives replacing embryology and organic chemistry)		
FOURTH YEAR		
(Same as Second Year of regular Medical Curriculum)		

*Note—When a prescribed minimum amount of High School work in corresponding subjects has been offered for entrance, other subjects may be substituted for those indicated.

ADVANCED STANDING.

Every applicant for advanced standing is required to present credentials from an accredited college, and to pass such examinations as may be required to show satisfactory completion of courses equivalent to those for which he seeks credit.

Moreover, the usual entrance requirements to the first year

class must be satisfied, and evidence of a good moral character must be presented to the Dean of the School of Medicine.

Special Students.

Students may be admitted to the School of Medicine without passing the regular examinations required for entrance, under the following conditions: (1) They must be at least 21 years of age; (2) they must show good reason for not taking a regular course; (3) they must pass such examinations or other tests as shall demonstrate fitness to pursue profitably the subjects selected by them. Such students are expected to do specially good work in the subjects which they choose. If at any period of the session the work becomes unsatisfactory, their connection with the University shall be severed by the Dean of the School. They are not considered as candidates for the degree, and cannot be registered as regular students, unless they subsequently fulfill the regular entrance requirements.

Postgraduate Course for Physicians.

During the month of May, 1913, a special postgraduate course in clinical pathology and bacteriology was offered. This course is practical in character, and designed especially for the needs of the practitioner. It is the intention to repeat this course every year. A special circular of information will be sent upon request.

Graduate Work in Medical Sciences.

Special opportunity is given, and every encouragement is offered, to students who desire to do advanced work in any of the fundamental medical sciences. By a year of graduate work, the Master's Degree (A.M.) may be secured, and in three years the degree of Ph. D. Advanced work of the research type in the fundamental medical sciences is highly desirable as a basis for the most thorough work in clinical medicine. It is especially advantageous, however, for those students who desire to specialize with a view to becoming teachers in any of these branches. As previously mentioned, the demand for such teachers far exceeds the supply, and offers an attractive career which many graduates of this school have followed with success. Fellowships and scholarships are available to those who are qualified for graduate work. For further details, see general catalogue or separate announcement of the Graduate School, University of Missouri.

To conduct research work successfully, it is self-evident that the teachers themselves should be active investigators. Such teachers are, moreover, as is proved by experience, those whose interest and enthusiasm for their work is also the source of inspiration for their undergraduate students. From every point of view the encouragement of research work is therefore a matter of highest importance. As substantial evidence of the activity of the Medical School of the University of Missouri along this line, the following

list of publications from the various laboratories for the present year may be of interest:

PUBLICATIONS, 1912-13.

1. From the Department of Anatomy and Histology.

Jackson, C. M., on the Recognition of Sex through External Characters in the Young Rat. *Biological Bulletin*, 1912.

Jackson, C. M., Postnatal Growth and Variability of the Body and of the Various Organs in the Albino Rat (in press).

Jackson, C. M., and Lowrey, L. G., On the Relative Growth of the Component Parts (Head, Trunk and Extremities) and Systems (Skin, Skeleton, Musculature, and Viscera) of the Albino Rat. *Anatomical Record*, 1912.

Lowrey, L. G., On the Growth of Dry Substance in the Albino Rat. *Anatomical Record*, 1912.

Johnson, F. P., The Development of the Mucous Membrane of the Large Intestine and Vermiform Process in the Human Embryo. *American Journal of Anatomy*, 1913.

Johnson, F. P., The Effects of Distention of the Intestine upon the Shape of Villi and Glands. *American Journal of Anatomy*, 1913.

Heldt, Thomas J., Moellgard's Reticulum (ready for publication).

2. From the Department of Pathology and Bacteriology.

Dolley, D. H., The Morphology of Functional Activity in the Ganglion Cells of the Crayfish, *Cambarus virilis*. *Archiv f. Zellforschung*, 1913.

Dolley, D. H., The Morphology of Functional Depression in Nerve Cells and its Significance for the Normal and Abnormal Physiology of the Cell. Presented before the Amer. Asso. of Pathologists and Bacteriologists, Washington, May 8, 1913.

Mitchell, O. W. H., Suppurative Abdominal Lymph-adenitis, due to a diplo-streptococcus. *American Journal of Medical Sciences*, 1913.

Mitchell, O. W. H., Bacteria and Disease. *Bulletin of the University of Missouri, Medical Series*, 1913.

3. From the Department of Physiology, Physiological Chemistry and Pharmacology.

Greene, C. W., An Undescribed Longitudinal Differentiation of the Great Lateral Muscle of the King Salmon, *Anatomical Record*, 1913.

Greene, C. W., The Anatomy and Histology of the Alimentary Tract of the King Salmon. *Bulletin U. S. Bureau of Fisheries* (in press).

4. From the Department of Preventive Medicine.

Calvert, W. J., Prevention of Typhoid Fever, *Bulletin of the University of Missouri, Medical Series*, 1913.

Low Cost of Medical Education.

Another advantage is the unusually low cost at which premedical and medical education of the highest type may here be obtained. In order to show what it actually costs, statistics have been collected from both premedical and medical students of the University of Missouri, showing the total expenses for the school year. The approximate average cost per student is indicated for each item.

Average Cost for	Premedical (1st and 2nd yrs of Combined Course)	Medical (3rd and 4th yrs. of Combined Course)
Board	\$112	\$112
Room	\$48	\$48
Library, Hospital and In- cidental Fees	\$20	\$20
Laboratory Fees	\$30	\$40
Books and Stationery	\$20	\$30
Clothing	\$50	\$50
Incidentals	\$65	\$75
Average total	\$345	\$375

Tuition at the University of Missouri is free, but students who are non-residents of Missouri pay a tuition fee of \$10 a semester.

From the above table it is evident that the average total cost for the school year (nine months) is about \$345 in the premedical, and \$375 in the medical years. The average is of course considerably higher than necessary, due to those who are able to afford many luxuries. The minimum figures, however, show that by economy, the cost may easily be reduced \$100 below the total average given above. Thus the total cost for the four years is less than that for two years of medicine alone in many of the prominent schools.

Opportunity for Self-Support.

In the case of students working their way through (about half of the class) the net cost is even reduced considerably lower. The average amount earned by self-supporting students during the school year in the premedical classes was \$132 (\$25 to \$204) and in the medical classes was \$154 (\$11 to \$337). It is therefore evident that by earning at least \$100 more during the summer vacation it is possible for the average student to pay his entire way through the premedical and medical years. This is actually accomplished by a con-

siderable number of students. Students who desire work should apply to the Employment Bureau of the Y. M. C. A., University of Missouri. As a rule, every student should have at least \$100 ahead at the start, and those who come before school opens have the best chance for employment. Board and room may be obtained in the University dormitories and dining club for about \$3.25 a week, but applications must be filed early, as the space is limited.

Rollins Scholarship.

The Rollins Scholarship in the School of Medicine is a prize of fifty dollars (\$50.00), which is awarded by vote of the Medical faculty to that member of the first year class (third year of combined curriculum) who has made the best record during the course.

Medical Society.

For many years the medical students have regularly conducted a medical society which has been very successful. At the meetings (at present monthly) the program consists of papers by students, supplemented by talks from faculty members or other visiting guests. Premedical students are also eligible to membership.

Register of Students.

At Commencement in June, 1912, the Medical Certificate was awarded to fifteen students. During the session 1912-13 there were enrolled twenty-seven in the First Year class, eighteen in the Second Year class, twelve Special students in the Training School for Nurses, and six in the Postgraduate Course, a total of sixty-three. The names of these students are published in the general Catalogue of the University.

High Standing of the School of Medicine.

The School of Medicine of the University is rated in the highest class (A plus) by the Council on Medical Education of the American Medical Association. It is also a member of the Association of American Medical Colleges. In the report of the Carnegie Foundation previously referred to, the facilities of the Medical School of the University of Missouri are summarized (p. 251) as follows: "The medical department occupies a new and well equipped building, excellently adapted to its purposes. The teaching is in charge of full-time instructors of modern training and ideals. A university hospital of 45 beds gives the department the advantage of clinical material and connection, even though the actual instruction is limited to the work of the first two years, a feature of great importance. There is a library supplied with important current periodicals, domestic and foreign."

UNIVERSITY CALENDAR.
AT COLUMBIA.

Summer Session.

1913.

June 12,	Thursday, Registration.
June 13,	Friday, Organization of Classes.
July 4,	Friday, Holiday.
August 12,	Tuesday, Lectures Close.
August 13,	Wednesday
August 14,	Thursday
	} Examinations.

First Semester.

September 15, 16, 17,	Monday, Tuesday and Wednesday, Entrance Examinations and Registration.
September 18,	Thursday, at 8 A. M. Class Work in all Divisions Begins.
September 18,	Thursday, at 10 A. M. Opening Convocation.
November 27,	Thursday, Thanksgiving Holiday.
December 19,	Friday, at 4 P. M. to
1914.	
January 5,	Monday, at 8 A. M.
January 24,	Saturday, to
January 31,	Saturday
	} Christmas Holidays.
	} Mid-Year Examinations.

Second Semester.

January 29, 30, 31,	Thursday, Friday and Saturday, Entrance Examinations.
February 2, 3,	Monday and Tuesday, Registration, Second Semester.
February 4,	Wednesday, at 8 A. M. Class Work in all Divisions Begins.
February 5,	Thursday, at 10 A. M. Opening Convocation.
April 9,	Thursday, at 4 P. M. to
April 15,	Wednesday, at 8 A. M.
May 31,	Sunday, Baccalaureate Address.
June 1, 2,	Monday and Tuesday, Senior Class Exercises.
June 3,	Wednesday, Alumni Day.
June 4,	Thursday, Commencement Day.
June 5,	Friday to
June 12,	Friday
	} Final Examinations.

THE UNIVERSITY OF MISSOURI.

The University of Missouri stands at the head of the educational system of the State. It is one of the oldest institutions in the West.

The University was founded at Columbia in 1839 and instruction in academic work was begun in 1841. Few schools in the United States has made the advancement that Missouri has during the past fifteen years. In 1897 the enrollment was only 805 and in 1912 it was more than 3,000. The increased enrollment is but indicative of the development of the school in educational efficiency.

The work of the University is now carried on in the following Schools and Colleges:

- College of Arts and Science
- College of Agriculture
- School of Education
- School of Law
- School of Journalism
- School of Medicine
- School of Engineering
- School of Mines and Metallurgy
- Graduate School
- Extension Division

All of these divisions are at Columbia with the exception of the School of Mines and Metallurgy, which is located at Rolla. In addition emphasis is given particular lines of work by the establishment of minor divisions, the chief of which are the Agricultural Experiment Station, the Engineering Experiment Station, and the Military School.

The fundamental aim of the University is the development of the highest and most efficient type of citizen. The school is supported by the State and endeavors to return to the State practical service. Of later years the University has endeavored to go beyond the campus in its influence on the welfare of the people of Missouri. Extension courses, experiment farms, and free literature on practical subjects are some of the methods adopted. The various extension courses have proven highly satisfactory and have rendered real service to people of the State who previously benefited only indirectly from the University.

The University is located at Columbia, a town situated half way between St. Louis and Kansas City near the center of the state. It is reached by the Wabash, and the Missouri, Kansas and Texas Railways. Columbia is a progressive and prosperous town having doubled its population in the last few years. It has nearly twenty miles of paved streets.

The University grounds cover more than seven hundred acres. The main divisions are in the Quadrangle, the Horticultural Grounds, the Physical Education Grounds, and the Agricultural College Farm.

The following University buildings are located at Columbia: Academic Hall; Laws Observatory; separate buildings for Chemistry; Agricultural Chemistry; Physics; Zoology and Geology; Law; Engineering; Manual Arts; three power houses; Medical Laboratory Building; Parker Memorial Hospital including the Busch Clinic; Agricultural Building; Horticultural Building; Green Houses; Live-

Stock Judging, Dairy, Farm Machinery, and Veterinary Buildings, and the Agricultural College Farm Barns and Buildings; Switzler Hall, for the School of Journalism; Benton and Lathrop Halls, dormitories for men; Read Hall, the dormitory for women; Rothwell gymnasium; the houses for the President of the University and the Dean of the College of Agriculture; the High School, and the Elementary School Buildings used for practice schools in the School of Education.

Full information regarding the University is given in the catalogue which will be sent on request without charge. For this or special bulletins of the Graduate School, College of Arts and Science, College of Agriculture, School of Education, School of Law, School of Medicine, School of Engineering, School of Journalism, and the Extension Division, write to

DEAN OF THE UNIVERSITY FACULTY,
University of Missouri,
Columbia, Missouri.

THE
UNIVERSITY OF MISSOURI
BULLETIN

GENERAL SERIES

FOR 1913 VOLUME 14

EDITED BY

HUGH J. MacKAY

University Publisher

Number 1, January	Summer Session
Number 2, February	College of Arts and Science
Number 3, March	Graduate School
Number 4, April	School of Education
Number 5, May	Catalogue
Number 6, June	School of Medicine
Number 7, July	School of Law
Number 8, August	School of Journalism
Number 9, September	School of Engineering
Number 10, October	College of Agriculture
Number 11, November	College of Agriculture (Short Course)
Number 12, December	Second Semester Courses

Published by
UNIVERSITY OF MISSOURI
COLUMBIA, MISSOURI
Issued Monthly

University of Missouri - Columbia



010-103950404

University of Missouri Libraries
University of Missouri

MU Catalogs

Source information

Identifier	MU-Catalog-1913-Medicine-1913-1914
Barcode	010-103950404
Format	Book
Content type	Text
Notes	

Capture information

Date captured	2018 October
Scanner manufacturer	Ricoh
Scanner model	MP C4503
Scanning software	
Optical resolution	600 dpi
Color settings	8-bit greyscale
File types	Tiff
Notes	

Derivatives - Access copy

Compression	LZW
Editing software	Photoshop
Resolution	600 dpi
Color	8-bit greyscale
File types	Tiffs converted to pdf
Notes	Image editing: pages lightened, canvassed, and noise removed.