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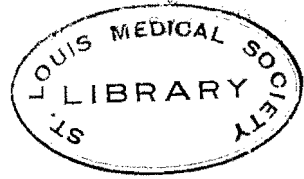
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Dedication of the New Buildings of Washington University Medical School.

Washington University in St. Louis

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The Dedication
of the New Buildings
of Washington University
Medical School



April 28, 29 and 30, 1915

St. Louis

17163

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Dedication of the Buildings of the Washington University Medical School

THE Washington University Medical School was reorganized in 1910, and plans were prepared for the erection of new buildings to accommodate the laboratories, the library and the out-patient department of the school. Construction was begun in 1912 and completed two years later. The Barnes Hospital and the St. Louis Children's Hospital entered into affiliation with the Medical School and erected hospitals in immediate contact with it. On April 28, 29 and 30, 1915, exercises were held to celebrate the completion of this group of buildings designed to promote the practice, the teaching and the progress of medicine.

On Thursday, April 29, 1915, at 10 A. M., a procession formed in the Rotunda of the Barnes Hospital in the following order: I. Officers of administration of Washington University, the Mayor of the City of Saint Louis, speakers of the day and representatives of the Faculties of Washington University; II. Delegates; III. Guests of the University; IV. Faculty of the Medical School.

At 10:30 A. M. exercises were held in the Assembly Hall of the Medical School.

The presiding officer, Acting Chancellor Frederic Aldin Hall, said: "In grateful acknowledg-

ment of Him who crowns with favor the intelligent efforts of man, the exercises of the day will be opened with prayer by the Right Reverend Daniel Sylvester Tuttle, Bishop of the Diocese of Missouri.

Prayer

O Merciful Lord and Heavenly Father, we thank Thee for Thy goodness and loving kindness to us and to all men. Grant to us pardon and peace that we may be cleansed from all our sins and serve Thee with a quiet mind. Accept, we pray Thee, at our hands, the dedication of these buildings to Thy Glory and to the service and benefit of the bodies of men which have been fearfully and wonderfully made by Thee.

May Thy hallowing Spirit rest for guidance and grace upon those who teach and those who learn and those who serve and those who suffer here. May the light of Thy countenance shine upon all those who by their gifts or care make possible the precious benefits and blessed cures promoted in and from this place.

O Lord and Merciful Savior, Who didst choose Thy servant St. Luke not only to be an evangelist and teacher, but didst raise him up to be a physician of the body, pour the riches of Thy grace, we humbly beseech Thee, on all men called by Thee to minister as physicians. Implant in their minds the likeness of Thy holy Self. Strengthen them to endure hardness and evermore establish them with Thy free Spirit.

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Clothe all professors and students of colleges and seats of learning devoted to medicine with growth in knowledge and with abundance of Thy heavenly love.

Direct us in all our doings this day with Thy most gracious favor and further us with Thy continual help, that in all our works, begun, continued and ended in Thee we may glorify Thy holy name and finally, by Thy mercy, obtain everlasting life, through Jesus Christ our Lord, Who has taught us to pray to Thee, O Almighty Father, in His prevailing words:

Our Father who art in heaven, hallowed be Thy name, Thy kingdom come, Thy will be done on earth as it is in heaven. Give us this day our daily bread; and forgive us our trespasses as we forgive those who trespass against us. And lead us not into temptation, but deliver us from evil, for Thine is the Kingdom and the power and the glory for ever and ever. Amen.

ACTING CHANCELLOR HALL: Announcement by the President of the Corporation, Robert Somers Brookings, the one man, pre-eminently, whose dream is this day realized.

Announcement by the President of the Corporation, Robert Somers Brookings

The published report of the Carnegie Foundation for the Advancement of Teaching on the condition of medical education in this country, its later report on medical education in Europe, and

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the more recent findings of the King Edward Commission on medical education in London, have made medical training a very live issue in this country. These documents have been so thoroughly discussed and commented upon by various committees appointed for the purpose that I believe the practicing profession, and those interested in medical education, have arrived at a general understanding of what should constitute today an ideal plant and organization for the teaching of medicine and for medical research.

In the laboratory buildings we dedicate today, and their affiliated hospitals, Washington University has undertaken, both in the construction of the laboratory buildings and in the supervision of the hospital buildings, to produce a plant which we believe conforms to this ideal.

As our plans contemplate ultimate hospital facilities of approximately five hundred beds, and an out-patient service of twelve thousand visits per month or more, we have adopted, for our student body, a class unit of from sixty to seventy-five, or a school unit of from two hundred and forty to three hundred students. We believe that our laboratory buildings, in construction and equipment, provide every facility for a student body of this size, as well as every provision for extensive work in research.

We believe that the hospitals represent the last word both in construction and equipment for teaching purposes. They are, moreover, so related to our laboratory buildings, including the out-patient

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service and mortuary department, as practically to place them under one roof; thus offering the maximum facilities and convenience for the ever-increasing interdependence of clinical and laboratory work.

The organization or administration involves full laboratory and clinical staffs, so compensated as to attract to our service scientific ability of the first rank, and our curriculum conforms, we believe, to what is recognized as the highest standard of medical education.

Fronting upon a park of fourteen hundred acres, our location could scarcely be improved upon, and while far removed from those districts which have heretofore furnished the mass of both our hospital and out-patient patronage, our superior facilities here are such as to attract patients in large numbers from all parts of the city.

We opened the hospitals and dispensary in December with four hundred beds and out-patient facilities for more than twelve thousand visits per month, and during the month of March we averaged an occupancy of two hundred and twenty beds, over two hundred of which were clinical, and a total out-patient service for the month of nine thousand two hundred and forty-three visits, far exceeding in this short period our greatest expectations.

While this amount of service is much more than sufficient for our present student body, it is perfectly evident, from the rate of growth, that the in- and out-clinical material, both for teaching and research purposes, will continue to be in excess of even the large increase in student attendance which we

have every reason to expect in the near future.

We hope that our efforts will contribute, in some measure, to raising the standard of medical education in the West, and that we will add, through research activities, our fair quota to the sum of the world's knowledge of medicine.

ACTING CHANCELLOR HALL: Announcement of the completion of the buildings by the architect, Theodore Carl Link, to whose comprehensive plans and masterly handling of details these creditable results are due.

Announcement of the Completion of the Buildings by the Architect, Theodore Carl Link

During the many years of my career as an architect I have never performed this ceremony with more pride or greater satisfaction than on this occasion. And it is not merely the satisfaction of the builder who has produced a creditable piece of work, but rather the pride of having, through this work, become closely identified with an institution, the humanitarian mission of which is destined to become world wide and a recognized power in the field of education and medical research.

No one man, however, may claim all the credit for a great work like this. Nearly a score of earnest men have toiled with me to create an ideal. The entire faculty of the Medical School has faithfully collaborated with me for several years to produce a result of which we may jointly be proud.

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Mr. Chancellor, our work is done as far as the outward shell is concerned. In placing it into your hands I do so with regret, because it has been most interesting work and because our collaboration has been of the most agreeable kind.

These keys will open the gates so that Science may breathe a soul into this formidable pile of brick and stone. May its lustre spread over the world to the everlasting glory of Washington University and its generous President, Robert S. Brookings.

Response by the Acting Chancellor of Washington University, Accepting the Buildings

As the representative of the Corporation of Washington University I accept these keys, symbolizing the completion of these buildings.

It is no doubt as true today as it has always been, that the assiduity of the investigator and the personality of the teacher are the two most potent factors in lending value to any seat of learning. While these facts remain, yet in medical education at least modern methods of research and modern methods of instruction demand buildings of peculiar construction and appliances of great intricacy and completeness in order effectively to serve even the ablest group of men. Then, too, the advantages of clinical observation and experience are essential adjuncts.

In buildings such as these, in equipment thus exhaustive, are found those attractive features

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which make it possible to secure men of the highest rank as investigators and as teachers. The authorities of the University feel that they are to be congratulated upon having secured that material environment which encourages the ambitious to their best efforts.

For the Corporation I accept these buildings as complete and ready for occupancy; as structures wisely designed, symmetrical in outline and perfectly adjusted in detail; as well constructed; as adapted to their purposes, and as thoroughly equipped; and I pronounce them now formally opened to the uses of the Medical School of Washington University.

Delegates from institutions of learning were presented to the President of the Corporation and to the Acting Chancellor of the University by the Marshal, Dr. Walter Eugene Garrey, Associate Professor of Physiology, as follows:

THE UNIVERSITY OF EDINBURGH

Professor Lindsay Stephen Milne.

HARVARD UNIVERSITY

President Abbott Lawrence Lowell.

YALE UNIVERSITY

Dean George Blumer.

UNIVERSITY OF PENNSYLVANIA

Dean William Pepper.

BROWN UNIVERSITY

Mr. Augustus Levi Abbott.

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UNIVERSITY OF PITTSBURGH

Dean Thomas Shaw Arbuthnot.

ST. LOUIS UNIVERSITY

Dean Hanau Wolf Loeb.

MEDICAL CORPS, U. S. A.

Capt. Thomas Dupuy Woodson.

WESTERN RESERVE UNIVERSITY

Dean Carl August Hamann.

DENNISON UNIVERSITY

Mr. Elmer Benjamin Packer.

LAFAYETTE COLLEGE.

President John Henry MacCracken.

THE TULANE UNIVERSITY OF LOUISIANA

Professor Rudolph Matas.

ST. LOUIS MEDICAL SOCIETY

President Robert Emmet Kane.

KNOX COLLEGE

President Thomas MacClelland

UNIVERSITY OF MICHIGAN

Professor Frederick George Novy.

UNIVERSITY AND BELLVUE HOSPITAL MEDICAL
COLLEGE

Vice-Dean Samuel Albertus Brown.

UNIVERSITY OF MISSOURI

Acting-Dean Guy Lincoln Noyes.

THE NEW YORK ACADEMY OF MEDICINE

Dr. Edward Dix Fisher.

MISSOURI STATE MEDICAL ASSOCIATION

Dr. Frank Joseph Lutz.

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CENTRAL WESLEYAN COLLEGE

President Otto Edward Kriege.
Professor Albert William Ebeling.

UNIVERSITY OF KANSAS

Professor John Sundwall.

UNIVERSITY OF ILLINOIS

Dean Daniel Atkinson King Steele.
Professor Albert Chauncy Eycleshymer.

DETROIT COLLEGE OF MEDICINE AND SURGERY

Dean Burt Russell Shurly.
Professor Charles Godwin Jennings.

PURDUE UNIVERSITY

Professor Oliver Perkins Terry.

UNIVERSITY OF MINNESOTA

Professor James Edward Moore.

DRURY COLLEGE

President James Gilmer McMurtry.

UNIVERSITY OF CINCINNATI

Professor John Ernest Greiwe.

JOHNS HOPKINS UNIVERSITY

Professor Theodore Janeway.

MISSOURI VALLEY COLLEGE

Mr. Alphonzo Chase Stewart.

MISSOURI BOTANICAL GARDEN

Professor George Thomas Moore.

LELAND STANFORD JUNIOR UNIVERSITY

Dr. Harold Phillip Kuhn.

ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH

Dr. Simon Flexner.

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THE MEMORIAL INSTITUTE FOR INFECTIOUS DISEASES
AND THE UNIVERSITY OF CHICAGO AND RUSH
MEDICAL COLLEGE.

Dr. James Bryan Herrick.

AMERICAN COLLEGE OF SURGEONS

Dr. Major Gabriel Seelig.

DR. ABRAHAM JACOBI was presented as the representative of the Medical Profession of America.

ACTING CHANCELLOR HALL: Address for the Faculty by the Dean of the Medical School, Dr. Eugene Lindsay Opie.

Address for the Faculty by the Dean of the
Medical School, Eugene Lindsay Opie

The buildings which we dedicate became possible as the result of changes in this medical school inaugurated scarcely five years ago. During this period preparations have been made for a new era in the development of the school, and its activity has been devoted in no inconsiderable part to the planning of organization, construction and equipment. Our thoughts have been upon the present and the future. It is not unfitting that we review today some of the traditions of the school.

The Medical School, later known as the St. Louis Medical College, was organized as the Medical Department of St. Louis University at a time when the city of St. Louis contained scarcely twenty thousand inhabitants scattered along the

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bank of the Mississippi River. With a faculty of five men it began instruction in medicine in October, 1842, in a small house owned by a member of the faculty, and after the first course of lectures the degree of Doctor of Medicine was conferred upon six students. The faculty was enlarged and the number of students increased. In 1849 the school occupied a new building, which was one of the most conspicuous in the city and contained large lecture rooms, a well stocked museum, ample anatomical rooms and a small chemical and physical laboratory for the professor of chemistry. An historian of the school says: "The personality of the teachers was of far greater importance than the content of their teaching. * * * Instruction was concentrated in the lecture and the force of the teaching lay in the impressiveness of the lecturer." One of those associated with the school at this time, Charles Alexander Pope, the surgeon, so impressed his personality upon the institution that it was widely known by the popular name of Pope's College. His industry and enthusiasm are still recorded in the museum of pathology which he helped to establish. In 1855 the school separated from the St. Louis University and became an independent institution, known as the St. Louis Medical College. Large classes were graduated annually. The period from 1864 to 1882 is associated with the notable career of John Thompson Hodgen, a surgeon well known throughout this country.

In this school, as in other medical schools of the United States, instruction consisted in a course of

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lectures given during approximately six months of the year, and all students were required to attend the same course of lectures during two years. In 1876 a graded course of three years was offered to students who desired to avail themselves of it, and in 1880 a progressive course of studies, divided into three years, was made compulsory. In 1891 the St. Louis Medical College became the Medical Department of Washington University. The Medical Fund Society, which was established to hold "in trust property to be devoted forever to the teaching of medical science," built an excellent school building under the able direction of the late Dr. John Green, and this building was occupied by the medical school until last September. In 1897 the curriculum was extended so that four years of study were required.

The Missouri Medical College combined with the Medical Department of Washington University in 1899. The Missouri Medical College was founded in 1840 as the Medical Department of Kemper College, and five years later became the Medical Department of the University of Missouri. Its early history is intimately associated with the name of Joseph Nash McDowell, who was a nephew of Ephraim McDowell, the famous pioneer in abdominal surgery, and in many of its later annual announcements the school proudly designated itself the "McDowell College." McDowell, at different times, taught anatomy, surgery, pathological anatomy and clinical medicine, and founded in the school a large museum of natural history.

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At the time of their establishment each of the two institutions which constitute the present school, understood the advantages which are derived from association with a university. At a later period they became independent institutions, but finally assumed their place as an integral part of Washington University. They were the first medical schools established west of the Mississippi River, and have had an important part in supplying physicians to the middle western states. Although numbers are not a fair index of the character of an institution, it is of interest to note that the graduates of the Missouri Medical College are 2836; of the St. Louis Medical College, 2125; following amalgamation of the two schools the alumni number 660. The teachers of the school have included many eminent physicians of this city. I shall content myself with the mention of two names which will long remain fresh in our memory: Gustav Baumgarten and Washington Fischel.

Five years ago generous lay philosophers (I use the words of Dr. Jacobi) of this city, realizing the benefits which a medical school can confer upon a community, offered the school means to increase its staff of teachers and to obtain the equipment now needed for the cultivation of medicine as a science and an art. With a magnanimous desire to facilitate any changes which the University might find desirable, the existing Faculty of the Medical School resigned. I believe it peculiarly fortunate that the reorganization of all departments of the school has been per-

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fectured on a relatively small scale in the old quarters on Locust Street. During the four years which have been occupied by the preparation of plans for the new buildings the departments of the school have had opportunity to assume an established order. The requirements for admission to the school have been increased first to one year of collegiate work and two years later to two years of collegiate work. The University Hospital, controlled by the Medical School, has been reorganized in almost every detail, and this medical organization has been later transferred to the Barnes Hospital.

The changes which have been brought about within a very short period of time, permitting the establishment of the Medical School upon the plan of a department of the University, the generous support which the undertaking has received from citizens of this community and from the members of the former faculty, have imposed a peculiar responsibility upon all associated with the enterprise. In the present condition of medical education in this country, which must yet be regarded as a transitional stage between the old and the new, the result of an experiment of this kind cannot fail to have a far-reaching influence. The establishment of a moderately good school of medicine will be insufficient to vindicate the high purposes of those who have believed that medicine offers one of the greatest opportunities to serve the community. The School cannot afford to neglect any means by which the benefits of medical knowledge of today

may be transmitted through its students and its teachers to popular use. Its first purpose will be to train efficient practitioners. It must make available to them the knowledge of today, and must make sure that they obtain a preparation which will fit them to acquire new knowledge of the future. The ultimate success of the school will depend upon the relatively small number of unusually able men who will become fitted either as practitioners or as teachers to take the highest places in medicine. The resources of a medical school must be available for the training and self-preparation of those who are attempting to perfect themselves in some branch of medicine, whether it be to become a general practitioner, a surgeon, a teacher of physiology or an ophthalmologist.

Those medical schools of this country which have aspired to cast aside the methods of the past and adopt those of the best models of Europe have earnestly promoted investigation in medicine and have used it as a means by which to select teachers and inspire students. The habit of keeping pace with the development of knowledge may be acquired by attempting to add to knowledge. The teacher who has contributed to a science has an immense advantage when he attempts to inspire others with a love of truth. If the benefits of investigations into the nature and control of disease were limited to those conferred upon the investigator, medical research, doubtless, would be justified, by the consequent improvement of teaching

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and practice. Nevertheless, the introduction of methods for cure and prevention have taught us to realize that modern scientific medicine, with its deep insight into the nature of disease, is capable of conferring immense benefit upon mankind.

It has been said that a university is the atmosphere about a library. A medical school is, perhaps, the atmosphere of its laboratories and wards. The subtle influence which constitutes the relationship between the workers is an essential element of their success. In so far as we do not feel and express appreciation of demonstrated ability to add to medical knowledge, we discourage effort in the direction which we have selected. A generous regard for those who are animated by the same purpose is essential. Investigation is founded upon the capacity to express reality and is opposed to pretense, egotism and contention. All who have the success of this institution at heart will continue to foster a spirit of loyalty to the purposes which they support.

In this country, as elsewhere, it has proven far easier to establish the fundamental sciences, such as anatomy, chemistry, physiology and pathology, upon a basis where efficiency in teaching and investigation is the criterion of accomplishment than to elevate clinical medicine to the same plane. It may be that the lay and professional community of this country today does not have unqualified admiration for the type of teacher best adapted to promote the science of medicine and teach its intricacies to others. The clinician fortunately has abundant

opportunity to cultivate those qualities which endear him to a wide circle of friends, and by recognized success to become an influential member of his community, but should he wish to devote himself to the hospital ward and to the laboratory, he can follow his inclination only by the sacrifice of many opportunities to become an important factor in the social life about him.

There is a further difficulty in the development of the clinical teacher. Medicine is built upon the fundamental sciences of anatomy, chemistry, physiology, pharmacology, bacteriology and pathology. To contribute new methods of treatment and diagnosis, or to obtain deeper insight into the progress of disease it is essential that the methods of these fundamental sciences be applied to clinical medicine. It is essential that the clinician serve an apprenticeship in a laboratory where he is able to obtain such command of the methods of some fundamental science that he can use them to enlarge the domain of practical medicine. It is doubtful if this training can be obtained exclusively in the clinical laboratories of medicine and surgery. It must become one of the chief purposes of this school to devise means which will attract to the various departments of clinical medicine an increasing number of men who will forego the immediate advantages of practice for that laborious preparation which will fit them to become investigators and teachers of clinical medicine.

In the consideration of the large teaching staff often associated with a medical school, the immense

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plant needed to house it and the large resources necessary to conduct it, the obvious truth that those who teach medicine must simultaneously provide for the care of patients, may be overlooked. Neither the college, the graduate department of the university, the law school, the school of divinity, nor the engineering school has a corresponding function. Although the hospital and, perhaps, the dispensary exist as independent institutions, the diagnosis of disease and the treatment of patients, often by means of intricately technical methods, is performed by the teaching staff of the affiliated medical school. Care of patients must be maintained on a level which will serve as a model of practice for all who are preparing to become practitioners of medicine. To provide for the care of patients it is necessary to associate with the hospital specialists in the various subdivisions of medical and surgical practice for which experience has shown the necessity; laboratories where the technical, chemical and physical knowledge of the day may be applied to the study of disease must be established; there must be an ample supply of all the appliances and apparatus which have proven of value in the recognition and treatment of disease. The training of a large staff of men, capable of marshalling all that present knowledge makes applicable to disease, is the most difficult part of the task. Again, it may be said that modern experience teaches that the fostering of a spirit of investigation is an effective means of keeping physicians in touch with advances in method. The

scientific reports issued by a hospital may well serve as an index of how far its patients benefit from the developments of technical knowledge.

The hospital which is manned by a staff trained to recognize disease in whatever aspect it presents itself, supplied with the means needed for the care of patients and prepared to devise new methods and to test the value of those proposed by others, becomes a model for other institutions and serves as a clearing house where obscure disease may be recognized and where resistant conditions may be treated.

The medical school has an important part in determining the relation of the profession to the community. There is much discussion in lay as well as in professional literature concerning the relation of physician to patient. The medical school, which, through the dispensaries associated with its affiliated hospitals, supplies treatment to the indigent, is frequently forced to face this problem. It must, in some respect, replace those agencies which, in other countries, are under governmental control. In this country we have, as yet, scarcely considered the problem which the English Insurance Act attempts to solve—a plan by which medical care is furnished to fifteen million of the population. Realization of the obligation to care for the indigent sick in their homes as well as in the dispensary and in the hospital is indicated by the recent rapid development of social service. The medical profession and the medical school in the future, as in the past, must consider these problems

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with reference to the welfare of the community rather than with major reference to the interests of the profession.

In the plans originally devised for the reorganization of this school special provision was made for the establishment of a department of preventive medicine. The training of physicians capable of acting as official guardians of the public health is an urgent need; the more efficient instruction of all medical students in public and personal hygiene is desirable. Brilliant examples of the application of existing knowledge to prevent disease have been afforded by the control of tropical diseases in the Canal Zone and elsewhere, and in the prevention of typhoid fever by vaccination. Nevertheless, existing knowledge is not fully applied to the control of disease, and investigation in preventive medicine affords wide opportunity to contribute to public welfare. Such an opportunity should not be neglected by this medical school.

Whatever view is taken of the significance of the struggle which has possession of Europe few can deny that it brings into bold relief truths that are often forgotten. Science has no nationality, but national strength today is dependent upon the recognition of the value of science and its application to the routine of living. The value of exact or scientific methods of investigating physical, chemical, physiological and sociological problems is widely recognized, but this knowledge is not popularly applied. Remedial and preventive medicine represent only one phase of exact knowledge, but

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the establishment of an institution devoted to the pursuit and dissemination of truths intimately related to individual and social welfare cannot fail to become a significant contribution to the intellectual life of the community in which it is established.

ACTING CHANCELLOR HALL: Address by Dr. William Henry Welch, Professor of Pathology, Johns Hopkins University, Washington University's unpaid but deeply appreciated adviser on many important medical matters.

Address of Professor William Henry Welch Recent Improvements in Medical Education

One of the most significant events in the recent history of medical education in America, significant especially for the South and West of this country, has been the reorganization of the Washington University Medical School in accordance with the most advanced standards of modern medical teaching and research. This has required radical readjustments through the selection of the best heads and staffs of laboratories and of clinics, wherever they could be found available, and the construction of the hospitals and the fine new laboratories, which we are assembled today to dedicate. In behalf of sister institutions and of all interested in higher medical education, it is my privilege, upon this happy occasion, to offer hearty congratulations to this city and this University, and especially to its Chancellor and Medical Faculty, who have

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planned so wisely and effectively, and likewise to express the large debt of gratitude which medical education owes to the generous donors who have made possible this great development. Of these benefactors there is one whom it is fitting and for me a pleasant privilege to name, who has given not only munificently of his fortune, but freely also of his time, energy and thought; a man with keen apprehension of the needs of medicine, as of education in general, planning not for the moment only, but with far-sighted vision for the future—that envied possession of this University, the President of the Corporation, Mr. Robert S. Brookings.

I desire likewise to commend the high wisdom of the trustees of the Barnes Hospital and of the St. Louis Children's Hospital, who, by entering into affiliation with the University and by placing the professional service in the hands of the medical faculty, have made these institutions freely available for teaching and the advancement of medical knowledge, thereby rendering them of far greater service than otherwise both to patients and to the community.

This medical school is exceptionally fortunate in having the two great material needs of medical education supplied to it simultaneously, and so admirably,—well-equipped and adequately-supported laboratories and the control for teaching purposes of a good general hospital. The close proximity and intimate physical relations of hospitals and laboratories are of inestimable advantage to both institutions in securing concentration of

work and in mutual influence and helpfulness.

The ills which so long afflicted the medical schools of this country are traceable mainly to the establishment and development of these schools without real vital connection with either university or hospital, so that each class of institution has gone its own way without much thought of the needs of the others. The solution of the difficulties created by this situation still constitutes for many schools and universities their most serious problem. Surprising as it may seem, the greatest obstacle has usually been found in the establishment of the proper relations with hospitals.

That school or university is fortunate which controls its own endowed hospital, but the future of medical education would be dark if this were a necessity, so difficult would it be to meet such a requirement. As a rule, the university medical school must look to independent general and special hospitals, existing as either public or private foundations, the authorities of which are found willing to place the professional service in whole or in part in the hands of the faculty of the medical school, and to allow the public wards and dispensary to be freely available for teaching.

By establishing, through mutual agreement, a satisfactory relationship of this kind, the Barnes Hospital and the St. Louis Children's Hospital on the one hand, and the Washington University on the other, have set an example worthy of emulation in the solution of one of the most urgent problems of medical education in this country. The advan-

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tages to the medical school of this affiliation may be sufficiently apparent, but those to the hospital are not less real. The latter have been set forth in recent years so frequently and so convincingly that it is unnecessary to rehearse them on this occasion. A teaching hospital in affiliation with a good university medical school becomes thereby a far more useful and important institution. While promoting science and education such a hospital also best serves the humanitarian purpose which must always be its primary concern—the care of patients—by securing for them the best treatment and skill.

The greatest asset of the Johns Hopkins Medical School has always been the hospital, for which the founder provided in his letter of instructions to the trustees in 1873, that it “shall be a part of the medical school of the University.” Although with us the hospital and the university are separate corporations, each with its own endowment and board of trustees, the desired co-operation has been secured without fixed regulations and now rests securely upon established precedent and tradition, but it will doubtless rarely happen that affiliation between an independent hospital and a university can be satisfactorily attained in this simple way. Here at Washington University the union has been made secure by the admirable interlocking physical construction of the various institutions.

Although a distinctive feature in the improvement of medical education in this country during

the last quarter of a century has been the development of laboratories, your own new laboratories are so superior, so ample, so conveniently related to each other and to the hospitals, so perfectly adapted to their purposes, that for this splendid possession you are greatly to be envied. Here there is every assurance in the character of the scientific staff and the work already accomplished that the fine opportunities will be thoroughly utilized and the fundamental medical sciences will be taught and cultivated most fruitfully.

The union of the medical school with so excellent a university as the Washington University, cannot fail to be a source of strength to each institution. The school needs the control, the influences, the ideals of the university. The evils which have sprung from the creation of independent medical schools empowered to grant the doctor's degree—a type of institution peculiar to this country—have long been recognized and require no statement on this occasion. It has become increasingly clear that the future of medical education lies with the stronger university medical schools.

On the other side of the partnership it is equally gratifying that so many of our universities have passed from their merely nominal or step-motherly relations with their medical departments, where such existed, to the realization that in no other way can they so greatly strengthen the university and extend its field of usefulness than by taking these departments fully under their wings and securing for them adequate support and oppor-

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tunities. Wherever the university is unable to nourish its medical department, it is better that inanition be hastened by severance of the cord connecting them.

The readjustments necessitated in the transformation of a medical school of the older type into one meeting the highest modern standards are not easy to make in any case, and I assume, without accurate information, that in a school with the traditions, the honorable history and the distinguished teachers of the Washington University Medical School the difficulties could not have been small, and that here again this medical school has set a lofty example of a spirit of self-sacrifice and of co-operation which indicates devotion to high ideals on the part both of the old and of the new order. Whatever may be the changes in method and the increase of opportunity, there can be no break with the spirit of such men as Pope, Hodgen, McDowell, Mudd, Green, Baumgarten, and the recently so deeply lamented Fischel, who have been cherished ornaments of this school and of the profession.

The interest manifested in the problems of medical education and research in this country, and the progress which has been made in this field during the last quarter of a century have been, indeed, remarkable. Many influences have been at work to account for this. The low estate into which our medical schools had fallen during the greater part of the nineteenth century had been long recognized, and efforts toward betterment

began to be made fifty years ago and longer; first it would appear by the Medical Department of the Northwestern University in 1859 in the introduction of graded courses, and later by increase in requirements for admission and by improvements in the curriculum at Harvard, the University of Michigan and a few other institutions.

The example set by the Johns Hopkins Medical School, opened in 1893, with standards of admission and of teaching, and with laboratory and hospital facilities far in advance of those previously existing in this country, has been a potent influence for improvement elsewhere, especially among the stronger schools.

The withdrawal of the granting of licensure to practice from medical schools by the creation of licensing and examining boards in most of the states of the Union has been a powerful weapon in forcing inferior schools to the wall and driving many out of existence. The strongest agencies leading to reform in recent years have been the admirable work and reports of the Council on Medical Education of the American Medical Association, acting with great force through professional opinion, and the Report on Medical Education to the Carnegie Foundation for the Advancement of Teaching by Mr. Abraham Flexner, acting on public as well as medical opinion, and ranking among the most remarkable and influential documents in educational literature. While much still remains to be accomplished, there have resulted from these various influences and agencies within

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an astonishingly short space of time a most desirable reduction in the number of medical schools and a most gratifying elevation of the average standards of admission and of teaching, together with improvement of educational and research facilities.

The disadvantages which have resulted from the divorce for so long a period of professional training from collegiate and university education in America are strikingly exemplified by the great difficulty encountered in determining satisfactory requirements for admission to our medical schools. The requirement of no more than a high school training is too low for a permanent standard of admission. While at the Johns Hopkins we have been satisfied to link the medical school onto a completed collegiate course, at the same time requiring the college to supply the necessary training in the sciences fundamental to medicine, and it has worked well with us, doubtless this is too high a standard at present for most of the schools of the country.

The transverse bisection of the college course and the telescoping it into the medical course, substituting during the two college years for the customary liberal studies mainly work in the natural sciences, seems likely to be the national standard of admission, but it is far from a satisfactory solution of the problem. It is earnestly to be hoped, as advocated by President Lowell, that by improvement in secondary education the age of graduation from college may be lowered, so that a larger num-

ber of schools may find professional training on a liberal education, which the two years in college devoted mainly to the sciences of course does not supply.

The spirit of independence with which the problems of medical education have been attacked in the better schools of this country has been a significant feature of the upward movement. Ours is a country of educational experiment and not least such in medicine. There are certain features distinctive of the best of our medical schools, as compared with foreign schools, and such characteristics are not likely to diminish.

The laboratory plays a larger part in the routine undergraduate medical training with us than it does in Europe. From being the weakest side of the medical curriculum in times past the laboratory subjects have become the strongest in our better schools, so that the so-called theoretical subjects are now taught most practically, and the practical subjects often most theoretically. The sciences of anatomy, physiology, physiological chemistry, pathology and pharmacology are now taught and cultivated in this country with results most creditable to American science. While here at Washington University there is no lack of balance between the laboratory side and the clinics, there could be no more impressive illustration of the important position which the laboratory has come to occupy in medical education than the splendid new laboratory buildings which we are assembled to dedicate. Our great defect is in laboratories of

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hygiene, a defect which every effort should be made to supply, for there are new missions and attractive careers opening for physicians and others trained in preventive medicine and hygiene. The ideal would be schools or institutes of hygiene in which the various sciences and departments of this broad subject should be represented.

The especial development of laboratory teaching and research in our medical schools has given emphasis to certain educational ideals and principles, familiar enough to universities and indeed characteristic of them, but less so to the medical schools of the past. In modern laboratories the professors and teaching staff give their entire time to their work; capacity to advance their subjects by research is recognized as an important qualification for the laboratory teachers, who are chosen from wherever the best available men can be found; opportunity is given for prolonged and thorough training to assistants preparing for careers in their chosen subjects, and demonstrative and expository teaching is of minor importance in comparison with that direct personal contact with the object of study which alone gives abiding, living knowledge.

The manner and extent to which these educational ideals of the university, which are now realized in the laboratory, can be applied also to clinical organization and teaching is perhaps at present the most interesting and the most discussed problem of higher medical education. For several years it has engaged our attention at the Johns Hopkins Medical School. After careful

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and prolonged deliberation the advisory board of our medical faculty formulated a plan, usually designated the full-time, but better the university system of clinical organization and teaching, and embracing the essential ideas advocated by Dr. Barker in a notable address in Chicago over a decade ago. This was presented to the General Education Board, which, by a generous gift, has enabled us to put the new plan into full operation beginning last October in the departments of medicine, of surgery and of pediatrics. While, perhaps, too early to express final judgment, our experience thus far with the new system has been most gratifying and has more than met our expectation of the advantages inherent in the plan.

It has been a satisfaction to learn that the university scheme of organization of the main clinical departments has been favorably received at the Washington University Medical School, and that it is your desire and intention to introduce it when the requisite funds are available.

With us it was not dissatisfaction with our clinical teaching and organization which led to the change, but rather the belief that there was a great opportunity to effect a still further advance and to initiate a far-reaching reform in medical education. The improvements in clinical teaching made mainly under the guidance of Dr. Osler twenty years ago at the Johns Hopkins Medical School and Hospital, by the introduction of the English system of clinical clerks and surgical dressers, which is far superior to the Praktikanten system

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of the German clinics, and of a staff of residents and assistants above the ordinary internes, were important contributions to medical education in this country.

The conduct of one of the main clinical departments in a first-class school and hospital demands today even more insistently than that of a laboratory the time and devotion of those in charge. The subjects themselves are the most important and occupy the most time in the curriculum, and the work of teaching, of investigation and of hospital practice, if properly performed, is quite incompatible with a considerable outside practice.

The full-time system meets this situation by creating the great opportunity for entire devotion to this work by paying adequate living salaries intended to relieve the professor and a staff of assistants of the necessity of seeking their livelihood in outside practice. The salaries are larger than those paid to laboratory teachers, although perhaps not larger than the latter should receive, but in justification of a higher remuneration it may be urged that the clinical professors have duties to the hospital as well as to the university and assume heavy responsibilities.

It is obvious that such salaries should not be paid if they are to be supplemented by income from private practice, so that any professional fees which may be derived from such practice go to the fund for supporting the plan. While private consultations are not prohibited, and should not be, the intention of the new plan and the absence of finan-

cial interest can be counted upon to restrict such practice within narrow limits and mainly to cases of scientific interest. The fees from this limited practice are inconsiderable and are not and should not be regarded as a factor of importance in financing the system.

It has been urged that the full-time professors are deprived of an experience useful to them as teachers by not engaging in outside practice. Doubtless there is value to a clinician of as wide an experience as possible with patients. He would gain something by family practice and by rural as well as by urban experience in practice, but within the limits of human capacity and endurance it is manifestly impracticable to combine with his duties as teacher, investigator and hospital practitioner all the varieties of medical experience which might conceivably conduce to his development, and concentration upon the work of the school and the hospital is believed to be the best disposition of the available energy and time. That the visiting of private patients under the ordinary conditions of consulting practice is a more valuable experience for the development of a clinical teacher than the careful study of cases of disease in the hospital with all the modern opportunities there afforded, is a proposition which it would be difficult to maintain.

It is needless to say that the plan does not contemplate depriving the school of the services of teachers who are also engaged in private practice, but the headship and the central clinical organization are in the hands of the full-time staff in the main clinical departments.

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When one considers what a first-class modern medical or surgical clinic really means, its richness in opportunities for advancing the science and the art of medicine, when provided with the requisite staff, laboratories, equipment and funds, the influence which it can exert upon the ideals and standards of students and of the profession, where in the whole domain of medicine can be found a career surpassing in the strength of its appeal to scientific and humanitarian interest and desire for useful service that which is opened to properly qualified clinicians under this university system of clinical organization?

Whether the full-time system be widely adopted or not—and financial considerations make doubtful its speedy extension to many medical schools—its underlying conception cannot fail to exert a profound influence upon clinical organization and teaching, as is already apparent. The need of improvement and reorganization of clinical teaching has come to the front and is now receiving serious consideration on the part of the Council on Medical Education of the American Medical Association. This need is quite as great in Germany as anywhere, notwithstanding the existence of such an ideal clinic as that of Friedrich Müller, in Munich, and the more potent scientific ideals there established by long tradition. The creation of numerous private clinics within recent years for the clinical professors and their increasing absorption in lucrative private practice have become matters of serious concern in many German universities.

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In touching thus briefly upon some of the advances and problems of medical education, I have spoken of some of the influences which have been at work, but I have not referred to the one which outweighs all others and is of supreme importance. This is the marvellous progress in medical science and art during the last four or five decades. This it is above all else which makes the fostering of medical education one of the worthiest functions of a university. It is the increased power to control disease by prevention or by cure which makes the strongest appeal to philanthropy to support medical education and research, and which is of the highest significance to society. A generation ago, with the single exception of the large gift of Johns Hopkins, medicine was the most neglected and apparently the most uninviting object of either private or public philanthropy. Today it is recognized by benefactors and by the public as one of the most rewarding. It is this newer medicine, with its vast and rapidly increasing possibilities of preventing or relieving disease and preserving health, its contacts more and more intimate with great social and industrial questions, which gives so lively an interest even outside of the profession to the problems and improvement of medical education and research, and it is this more than all else which calls for some such reform in clinical teaching and organization as I have described. This it is which has been the stimulus and the inspiration which have brought into existence these magnificent new medical foundations in the Washington University.

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And yet there has been no change in the essential aims of medicine, for these have always been, as they remain today, the prevention and the cure or relief of disease and injury. It is this constancy of purpose which gives to the history of medicine its unequalled continuity of interest, however full the record may be of wanderings in the darkness and of futility of effort.

Medicine, although the ancient mother of the biological sciences, herself entered fruitfully upon this field of development only about the middle of the last century through the establishment of the cell-doctrine as a firm foundation for pathology and by the application of physical and chemical methods to our understanding of the activities of the body in health and in disease. The great forward movement in the art of prevention and cure came later through the investigations of Pasteur and of Koch and their followers, which brought a fresh light, a new and saving knowledge concerning the origin and mode of spread of those diseases, the infections, which are of the highest racial significance in consequence of their epidemic prevalence and the large mortality caused by them in early life and the most productive years of maturity. A great stimulus was thus given to medical research in all domains, so that the face of modern medicine is very different and much fairer than that which she presented in olden times. Nor is this affected by the prevalence of superstition and charlatanry, which flourish today as they did in the seventeenth century, which was another period of

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rapid scientific progress. Indeed, I am inclined to believe that history would sustain the thesis that periods of scientific enlightenment are characterized also by striking manifestations of these world-old phenomena by the side of rational medicine.

The Washington University Medical School enters upon its new and wider paths of usefulness, a veritable renaissance, at this most fortunate time in medical history. The buildings now dedicated, we may feel assured, will have a worthy share in the advancement of knowledge and will afford the best of training to many students and physicians. Not only must the city of St. Louis feel a justifiable pride in this admirable medical school, but it can not fail to be benefited in vital ways by the presence here of those possessing expert knowledge and skill in matters of health and of disease, and by the scientific and humane work of these laboratories and hospitals. The influence of the high standards and achievements of this centre of medical teaching and research will, however, extend far beyond city and state, and will be an example and stimulus for scientific and educational progress throughout the country.

At 1 P. M. a luncheon was given to the delegates in the refectory of the Medical School.

At 2 P. M. addresses were made on the lawn of the Medical School between the North and South Laboratory Buildings.

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ACTING CHANCELLOR HALL: Upon the formal inauguration of Washington University, April 22, 1857, Harvard College was called upon to furnish the orator of the day in the person of Edward Everett. This afternoon, fifty-eight years later, upon what may not inappropriately be denominated the second inauguration of the University, Harvard again contributes the first speaker, President Abbott Lawrence Lowell.

Address of President Abbott Lawrence Lowell— Medicine as a Public Service

We have met here to celebrate the completion of the new buildings for a medical school and a hospital dedicated to the relief of human suffering, to the curing of the sick, and not less to the training of future practitioners and to the scientific study of disease and health. The vast growth of medical knowledge in the last few decades has made it necessary for the student of medicine to have a far greater grasp of scientific principles, much more familiarity with methods of diagnosis and treatment than ever before, and this has lengthened very much the period of medical education. It has very properly riveted our attention on the need of extensive scientific preparation. It is now usual to require that before entering the medical school the student shall have devoted a period equal to one year to the study of elementary chemistry, physics

and biology. A knowledge of the fundamental sciences, and a long and severe period of study in the medical school and the hospital is not only good for the practitioner, it is indispensable; but it should not wholly obscure another side of the subject.

To speak of the rise of the medical profession has become commonplace. To compare the times when the physician was a superior class of servant, or the surgeon was a barber, with their present exalted position, is a common source of self-complacency or pride to the profession; and yet people hardly realize fully a not less significant change that has been taking place of late—the development of medicine from a private calling to a public service.

From time to time the dominant interests of men have shifted,—more weight being thrown now upon one subject than upon another. This may be illustrated by the normal attitude that nations have assumed toward the people of conquered territories. During the sixteenth century the minds of Europeans were greatly agitated over the religious dissensions. When Spain conquered the New World, almost her first care was to convert the natives to Christianity. Before the century closed her revolting Dutch provinces rebelled; were engaged in a long war with her on religious grounds, and soon Europe was shaken to its foundations by almost universal wars of religion.

When we pass on to 1700, we find a change in the background of European history. Religion no

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longer forms the same dominant motive for great political upheavals as in the past. Economic causes have become more prominent. The Navigation Laws had recently been adopted, and the countries of Europe sought thereby to confine to the parent state the benefit of colonial trade. Adventurous merchants had penetrated the East Indies, but the governments to which they belonged made no attempt to convert the Hindus, striving only to control their commerce by means of chartered mercantile companies. This is a long story which reached its climax in the eighteenth century. It is indeed significant of the times that, as the colonial dependencies of the British Isles belonged to England alone, Scotland, after trying a wild and disastrous colonial adventure at Darien, opened the door of the English possessions to her young men by the union with England at the beginning of the eighteenth century.

Another hundred years brings us, at the close of the eighteenth century, to further change in the point of view. The struggles brought on by the French revolution and the wars of Napoleon were not primarily religious or commercial, but essentially political in the sense that they touched the form of government, the rights of the people, and the struggle between the neo-feudal and the democratic constitution of society. The change began, perhaps, with our own revolution, which, starting in irritation at the enforcement of navigation laws, ended as a political upheaval, and the new conception of society was in full swing by the time Napo-

leon traversed Europe, thundering, as Carlyle said, from the mouths of his cannon the principle "la carrière ouverte au talent."

If we pass over another hundred years, we reach our war with Spain, which led to our occupation of Cuba. There we made no attempt to change the religion of the inhabitants; we disclaimed all desire to control their commerce for our benefit; we exerted no pressure on their laws and institutions; but we did insist on their accepting our methods of sanitation. Without consulting them, and to no small extent against their will, we carried out the most modern improvements in the public health.

It is hardly an exaggeration to summarize this history of four hundred years by saying that the leading idea of a conquering nation in relation to the conquered was, in 1600, to change their religion; in 1700, to change their trade; in 1800, to change their laws, and in 1900 to change their drainage. May we not, then, say that on the prow of the conquering ship in these four centuries first stood the priest, then the merchant, then the lawyer, and finally the physician? To insist on a change in the religion of a people seemed, in 1600, to be normal and right; to have interfered with their private lives by a sanitary regulation would have appeared vexatious, if not oppressive. But to have attempted, in 1900, to impose on Cuba a constitution not desired by the people, would have seemed to most Americans an unwarrantable interference; to have limited their commercial liberty for our own benefit would have seemed selfishly oppressive; to have

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attempted to enforce upon them an unwelcome religion would have been thought by everyone outrageous; but to compel them to adopt sanitary regulations repugnant to them awoke not the slightest protest from anyone in the United States.

Now observe, this implies a relationship of the profession of medicine to the public wholly different from that of any other time. It signifies a responsibility for the public health, and this affects the standing of the profession as the guardian of one of the most insistent of general interests. It implies further that medical men, or at least the leading figures among them, should be regarded not solely as private practitioners, but also in a sense as public characters, and therefore should be in touch with the community, able to inform and lead it. Now there are two ways of leading the people, one by organization and manipulation, the other intellectual, by argument, by demonstration of principles, by a clear exposition of ascertained facts. This is the kind of leadership physicians most covet. Never was there a time when the medical profession stood more in need of a power of lucid statement, readily intelligible by educated men who possess no technical knowledge. There clings still around medicine much of the mystery of a craft incomprehensible to any but its votaries, and something of this must be true of every profession. But to instruct the public a man must be able to express himself in a way they can understand, and with a force that carries conviction to their minds. To do so he must be in contact with the

currents of human thought; he must himself be interested in things outside the limits of his own profession, and must have at his command as large a part as possible of the aspirations, the attainments, the traditions and the accumulated wisdom of the race. This is what we call general culture; and, other things being equal, the more a man has of it the more pervasive and compelling his influence will be.

In spite of a lack of thorough technical training in its early days, the medical profession in America, for more than a century, has held a remarkably high place in the community at large. If I draw an illustration from my native town, it is not because the practitioners there were better than elsewhere, but because one not a member of a profession knows far more about the local celebrities than about others. The notable physicians and surgeons of Boston, as of Philadelphia and the other older cities, have been great figures in the community, men of social influence, leaders in beneficent movements within and beyond the field of their own chosen vocation; and it is not perhaps unreasonable to connect this with the fact that they were college graduates who had the best liberal education then offered. Jacob Bigelow and John Collins Warren were eminent as surgeons, but they were also leading citizens, promoters of intellectual progress. Warren, for example, was active in many forms of literary and social, as well as scientific enterprise in his native town. He was acknowledged to be the first surgeon of his day

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there, and was also a man of great influence, highly respected by his fellow citizens. Most people think of him as an old man standing in the amphitheatre of the Massachusetts General Hospital when ether was for the first time given to a patient on the table. In doing so, he transformed anesthesia from the dream of an enthusiast to an inestimable boon for mankind; but in sanctioning the experiment he risked the hard-earned reputation of a lifetime, dearer to him than life itself, and perhaps he risked his life as well. We admire his courage, but we may reflect also that the possibility and the value of his sanction came from the fact that he was not only a great surgeon, but also stood in the community as a prominent citizen whom people trusted.

Unless the popular interest in medicine, and especially in preventive medicine and public health, declines, physicians are likely to occupy positions of increasing influence in public affairs. They may well occupy the position of general authority held in America by the clergy in the first half, and the lawyers in the second half of the period since our forefathers landed on this soil; but if so, they must have, as the ministers and the members of the bar had in the days of their power, not merely a technical, but a general education, and the best general education within reach. To combine the vast scientific training required by the modern physician with the broad, liberal education needed by leaders of the community is not easy, but that is no reason why we should not seek to solve the problem.

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ACTING CHANCELLOR HALL: An address by Henry Smith Pritchett, President of the Carnegie Foundation for the Advancement of Teaching, will be read by Professor John Livingston Lowes, Head of the Department of English.

Address of President Henry Smith Pritchett
—Medical Education in Missouri

The speaker who has just preceded me is from Boston, and the one who follows is from Minneapolis. I take it, therefore, that I am asked to say a word from New York as being in the central educational region of the country. For, while it is true that one might go east of Boston in longitude, it would be impossible to be east of Boston educationally. Perhaps in the same sense, it would be impossible to travel west of Minneapolis.

In a deeper sense, I cannot deny myself the pleasure of believing that I return home in such a visit as this. I was in Washington University as a teacher longer than I have ever been able to remain in any other place. As I look back at the men who were my colleagues, it seems to me that I have never been associated with a group of teachers more alert, more devoted, more energetic than those who wrought here between 1881 and 1898. One cannot give sixteen years of one's life to work like this without coming back to it with the feeling that one comes home.

In the splendid development that has gone on in the last eighteen years—resulting in the crea-

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tion of one of the strongest medical schools of the world—I see the realization of those hopes which, a quarter of a century ago, all of us treasured. William G. Eliot, and those who wrought well and truly in those early days, find here the fruition of their hopes.

Today, I venture to speak a word concerning a field of education in which I can speak only as a layman; and yet, I hope that it may not be out of place for a layman to speak upon this topic, for that with which we have to do is primarily medical education rather than medical practice.

The city of St. Louis has been one of the large centers for the training of medical students for nearly a century, the first medical school having been founded here in 1840. As in all American cities, rival schools arose out of the competition between great practitioners. Even today there remain some of the traditions that came from the rivalries of McDowell and Pope. In St. Louis these rivalries led to the founding of many schools. At one time there were as many as twelve medical schools in St. Louis turning out the young practitioners. The physicians and surgeons who went out from these schools spread over the entire West; and if one studies today the medical population of the states from Missouri to Washington and Oregon, one finds the output from the St. Louis medical schools everywhere forming a large tributary to the stream. While St. Louis has been the chief seat of the medical institutions in the state, Kansas City and St. Joseph are not to be for-

gotten; for these cities also, in their time, have added large regiments to the ranks of the local practitioners. Besides these, there have been a few sporadic schools in smaller cities, such, for example, as the Occidental College of Physicians and Surgeons at Joplin. In all, there have existed, at one time or another, some thirty-five medical schools in the state, of which nearly thirty had their seats in St. Louis.

The effect of this output on the city of St. Louis and on the state of Missouri, is a matter of great interest to note at this day. The population of the state, in 1914, is estimated at 3,373,000. The American Medical Association Directory of that year credits the state with 6,224 practitioners of medicine, or at the rate of one practitioner to each 540 inhabitants. St. Louis, with an estimated population in 1914 of 734,667, shelters 1,720 physicians, or one to every 425 men, women and children. In other words, the State of Missouri is one of the most bedoctored regions of the earth, and St. Louis has the pre-eminence of having more physicians to the thousand of population than almost any other city in the world. We sometimes talk of the fierce competition of business, but this is mild in comparison with the competition where, on the average, a physician has only 425 possible patients from whom to earn a living. It is quite evident that, so far as numbers are concerned, neither the state of Missouri nor the city of St. Louis would be inconvenienced if not a single graduate in medicine should be turned out in the next twenty years.

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When one comes to examine the sources whence the physicians of Missouri and St. Louis obtained their training, some interesting facts are brought to light. Out of a total of 5,889 Missouri physicians, whose records are given in the Directory, 4,040—about 70 per cent—were home trained. That is to say, they obtained their medical education in Missouri. Of these, 998 were trained in what are classified by the Council on Medical Education as “A” institutions, 736 in what are classified as “C” institutions, and 2,306—or about 40 per cent of all—were trained in institutions that have disappeared. Of the 1,889 physicians in practice in Missouri who were trained outside of the state, 789 came from “A” institutions, and 883 from institutions now merged or defunct. In other words, of the whole number of practitioners in the state, over half were trained in institutions which, for one reason or another, have ceased to exist; and generally that reason has been the fact that the schools were too weak to live under modern requirements.

Turning to the city of St. Louis, of a total of 1,677 practitioners whose records are given, 1,360 were trained in Missouri. Of these, 591 came from “A” institutions, 229 from “C” institutions, and 540 from institutions now merged or defunct.

The Washington University Department of Medicine and the St. Louis University School of Medicine have together contributed about 600 of the practitioners of medicine in St. Louis; or, in other words, the great mass of men now practicing in St. Louis were trained at home, and by far the

great majority of those physicians were trained in the weaker, not in the stronger, local schools.

From outside the state, medical immigrants have come in the main from Kentucky, Illinois, Iowa, and from the medical schools of Philadelphia, New York and Boston. The three outside medical schools which have contributed the largest number of practitioners to Missouri are, singularly enough, the College of Physicians and Surgeons of Keokuk, Iowa, the Louisville Medical School, and the Rush Medical School of Chicago. There was a time when Keokuk and Louisville did a wholesale business in the training of Missouri doctors.

To sum up these statistical results briefly, it may be said that they show:

First, that the state of Missouri and the city of St. Louis are enormously over-crowded with physicians;

Secondly, that the majority of these physicians—about 70 per cent—have been trained within the state, and

Finally, that the majority of these are from medical schools which were of the weakest class, devoted to the business of medicine rather than to the profession of medicine.

In looking back to the medical schools of twenty-five years ago, let us not do an injustice to them or to the men who have come out of them. We remember some of these men gratefully, and honor them today as splendid representatives of their profession, men like Hodgen, Mudd, and others, whose names are held in grateful memory.

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Out of nearly every school, however weak, have emerged physicians who, by their genius and energy, have come into high skill and great honor. Yet, when we recall the men whose names were an honor to the medical history of St. Louis, we find that, as a rule, they came from those schools which had the ideals and traditions of high professional service, not from those whose atmosphere was commercial. The great harm wrought by the weak medical schools is to be found in the fact that through them a mass of unfit and ill-trained men are turned into the profession. They are open doors, not only to the occasional ambitious and well-educated man, but also to the ignorant and commercial applicant. It is in this that the great harm lies, and in the condition that is brought about through the admission to any profession of men untrained to its ideals and unequal to its responsibilities. Under such circumstances, competition becomes intense. In the necessity for making a living, the temptation to use unworthy means is not held in check by the ideals of a thorough education. Under such conditions, the weak and unworthy medical school becomes a source of danger to the community and to the profession.

From the situation of twenty years ago we turn to the medical school of today, a school founded upon certain principles of broad public policy:

The first, that the citizens of a country, of a state, of a city, are entitled to physicians trained upon as high a plane as the needs of civilization and the rewards of the profession will permit.

Secondly, that in our day a sufficient body of practitioners can be obtained from amongst educated men; and

Thirdly, that the candidate for medicine, already an educated man, shall be given an opportunity to obtain, not only the scientific advantages of recent years, but the practical and clinical training of the hospital.

A practical question must be answered in determining the quality of the medical school of our day, and it is this: Can enough medical students be obtained under such conditions to supply the requisite number of practitioners and to replace the ill-trained physicians as they disappear?

The question is one of more than local significance because it forms, in large measure, the last plea that is put forth in defense of the poorly-equipped medical school. It is urged that a poor doctor must be had for the country, that a well-trained man will not leave city opportunities for countryside practice; in a word, that poorly trained doctors must be furnished in certain numbers or else the countryside will have no doctors at all.

This plea is without foundation. The experience of many countries, and of many states, shows that the graduates of weak schools, and of strong schools alike, go in large numbers to the cities. The city that harbors a weak medical school itself pays the larger part of the price, because its graduates go generally into the local practice. But it is also shown by the experience not only of Europe, but also of America, that the well-trained medical

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candidate will go wherever a practice is to be had, wherever a living in medicine is to be made. If such a living is not to be won, neither the graduate of a strong school nor of a weak school will enter the field. In other words, there is no reason to doubt that any American state or any American city can obtain a sufficient supply of well-trained physicians and surgeons whenever it will cease to admit to practice the ill-trained and the unfit.

In conclusion, I venture to say one word with regard to the future of this great medical school whose completion we celebrate today. The old time medical school was essentially and completely a school for the training of practitioners. The modern medical school, no less than the old time medical school, exists primarily for the training of physicians and surgeons. It would be a fatal blunder if the interests of this great majority of medical students were sacrificed to train a few men in research. Nevertheless, it remains true that the modern medical school must make its contribution to the advance of medical science, to the improvement of the methods of internal medicine and surgery; and that not to accomplish this would constitute an essential failure of the ideals under which the modern medical school is conducted.

As one looks today upon these splendid laboratories, the admirable hospital, the lecture rooms, all co-ordinated to form an institution for medical teaching which perhaps more completely realizes the ideals of our day than any other institution in the world, one recognizes that these things, great

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as they are, do not make the spirit of the modern medical school. That can be made only by the men who work and who teach in it. It is the faculty of the school that makes it either a great agency for human advancement or a mediocre training-place for the attainment of human skill. To those who work in this institution there has been committed an opportunity unequalled in the profession of medicine. Into their hands has been put a physical equipment adequate to the most far-reaching investigations. In our American institutions, whether in medicine or in other branches of science, there is a tendency to accumulate—to add more laboratories, to call for more facilities. In too many of our American universities the campaign for research has followed, in some measure, the tactics of General McClellan—the army of investigation was always getting ready but was never quite prepared to attack. To those to whom have been entrusted these splendid facilities we may well hope that there will come not only the spirit of work, but the courage to advance; not only the desire to possess the best and the latest facilities, but the ability to use to their full measure those that do exist; and that the faculty of this institution may breathe into these laboratories and hospitals a devotion, an energy, an intelligence that may make them alive, and that may result in contributions to the science of medicine which may be an honor to this city, to our country and to our generation.

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ACTING CHANCELLOR HALL: An address by George Edgar Vincent, President of the University of Minnesota—the dominating influence of medical education in the State of Minnesota and throughout the Northwest.

Address of President George Edgar Vincent

The patient, self-controlled congregations in colonial New England were wont to watch with hope the spending hour-glass by the preacher's side. We have today, in these passing trolley cars, a modern equivalent for the old device. I understand that the periodicity of these rattling shuttles is about three minutes. Let me reassure you at the outset: I shall detain you only two or three cars.

The presidential ignorance of medicine, which Dr. Lowell has so modestly suggested and so cleverly concealed, is now about to be convincingly demonstrated. With timidity I venture to point out that the noble figure at the prow of the Cuba-bound vessel was a government-paid official and not a private, practicing physician. This is significant for the future, not only of a medicated Monroe Doctrine, but of the domestic application of socialized sanitation and therapy.

As the representative of an ancient culture, the President of Harvard has done well to take us back three or four centuries. But for me, the spokesman of one of the crass, crude, utilitarian universities of these western states, so contemporary a theme

would hardly be appropriate. I propose to show a real zeal for the past, the remote past. I ask you to come with me to ancient Greece.

It is an ungrateful duty to strike, at this moment of your triumph, a discordant note. You are a-flutter with pride and satisfaction; you absorb praise avidly; the saturation point is yet far off. You meet out of doors that you may the more easily gaze upon these stately, convenient and cunningly-equipped buildings. You have done well; the scientific spirit of the hour compels you to admit this. You are even likely to imagine that an occasion of this kind is getting its first setting on the banks of the Mississippi. Come with me across the Gulf of Aegina to Epidaurus on the coast of Argolis.

It is the second century B. C. A company has assembled to celebrate the opening of a new pavilion in the famous classical clinic of Aesculapius. Look about you at this noble hospital and its medical buildings. This ornate, temple-like structure is the administration building. Here is a statue of the original physician, Dr. Aesculapius. The long buildings yonder are the wards; the charming circular structure to the right is the animal house, where, as with us, dogs and rabbits are sacrificed for the benefit of the patients. On this side you note a complete gymnasium with baths. Over there is a stadium; beyond you observe a theater. The Hieron of Aesculapius is, you see, both hospital and sanatorium; it is also something of a spa.

The resident staff of physicians is on a full-time basis. The fees go to the hospital. There is,

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of course, a certain amount of mysticism connected with the profession. Rites and ceremonies are practiced. There is a disposition when the limits of knowledge are reached to put faith in terminology, and in a metaphysic that often begs the question.

The methods of treatment are distinctly modern. Surgery is practiced usually while the patient is asleep. There is a story of a man coming with an arrow-head in his jaw. When he awoke after the operation it was to find the vagrant weapon in his hand. This almost suggests a popular magazine article on "the wonders of modern surgery."

Much use is made of suggestive therapeutics. Patients are soothed to sleep and supplied with vivid dreams which have notable effects. We find evidences of the employment of what we have come to know as the "twilight sleep."

Internal medicine is also practiced. Drugs of many kinds are in use. Baldness is cured, deafness banished and indigestion mitigated. One recalls the resourceful specific proclaimed by a street vender as "good for the hair, teeth and stomach."

Grateful patients leave at Epidaurus tributes to the physicians. These descriptions of symptoms and cures remind one of the spontaneous and convincing testimonials so blushinglly and reluctantly published by our contemporary medicine men. The Greek patients set forth the facts on stone tablets which were affixed to the hospital walls. This inspired hope and confidence in newcomers. Here is an idea for our wards and private rooms. Only

cheerful suggestions should, of course, be admitted.

Thus you see that you have been anticipated by more than two thousand years. Epidaurus, in the classic speech of East Boston, "beat you to it." Buildings, laboratories, wards, animal house, operations, drugs, out-patient department, resident staff—all that you set so much store by—were an old story in Argolis before any kind of Saint was thought of. There is a certain pathos in your pitiful modernity. You are so helplessly behind the times—of Greece. It is painful to speak so plainly. You look crestfallen. My sympathy goes out to you. But truth and the necessity of antedating Harvard left me no choice.

I am reaching—if I have not passed—the limits of your patience. You weary of this juggling with words. How absurd it is to try to conceal, beneath superficial likenesses, differences so essential and profound! If twenty centuries of time intervene, what shall we say of the distance in knowledge, methods and ideals between the cult of Aesculapius and modern medicine?

The Hieron of Epidaurus was the home of a guild of healers. They looked backward to a mythical founder and leader; they revered tradition; innovation came surreptitiously or by accident. These priests of medicine and surgery practiced their arts mystically. They impressed the many by the devices of secrecy and deception. They were essentially promoters of superstition; incidentally and empirically they hit upon fragmentary truth.

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What a contrast is presented by scientific medicine today! Members of the profession respect and admire leaders, but take nothing on mere authority. They repudiate sectarian ideas; they question and test the traditions from the past; they unceasingly seek new knowledge. They more and more offer to all the plain truth; they despise any suggestion of the occult.

The followers of Aesculapius were content with attempts at alleviation and cure. To them disease was an inevitable affliction. Modern medicine is still largely concerned with therapeutics, but more and more lays stress upon prevention. The idea of individual disease gives way to the conception of public health. And this itself is no longer regarded in a negative way merely; it is rather a positive ideal to be realized through public sanitation, sane living, wide-spread recreation.

The Hieron of Epidaurus was an independent center. To be sure priests of Aesculapius founded similar establishments at Rome and elsewhere, but these in no sense formed an organized system. Today we celebrate the rehousing of one of hundreds of centers which, scattered over the world, are nevertheless dominated by the same scientific spirit. These places are in constant communication; they carry on a vast co-operation in the service of a common cause, the discovery and application of new truth.

At Epidaurus neophytes were inducted into the mysteries of the cult and gradually assumed the duties of the guild. All was done by tradition,

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secretly and with esoteric rites. Here is carried on, openly and with standards and methods tested by experience and modified by new knowledge, the work of training candidates of the profession of modern medicine. These men are subjected to rigid discipline and tried by every kind of test. If they prove worthy they are admitted, not to a protected guild, but to the service of society.

We have then come a long way from Argolis to St. Louis. We greet you and offer our congratulations. You have three great tasks which are intimately related: the training of physicians, the advancement of knowledge, and the increase of public intelligence about disease, its cure and prevention. This can be a true center of modern medicine only as it recognizes and assumes these functions. A practitioners' course grows conventional and sterile when it is isolated from the work of investigation. A medical center is in danger of becoming self-absorbed and aloof if it fails to keep in contact with the public which it serves.

May Washington University combine the architectural beauty, the Greek ideals of physical perfection which sought expression at Epidaurus, with the modern conceptions of discipline, scientific research and public service which inspire the profession of our day.

At 4 P. M. there was a Garden Party on the grounds of the Medical School. The guests at the Garden Party visited the Laboratories and Library of the Medical School, the Barnes Hospital and the

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St. Louis Children's Hospital. Visitors were guided through the various departments.

At 7:30 P. M. a dinner was given to the delegates at the St. Louis Club. The President of the Corporation, Robert Somers Brookings, presided. The speakers were:

ALBERT ROSS HILL, President of the University of Missouri.

ABRAHAM JACOBI, Professor Emeritus of Diseases of Children in Columbia University.

DAVID ROWLAND FRANCIS, Member of the Board of Trustees of the Corporation of the University.

WILLIAM HENRY HOWELL, Professor of Physiology in the Johns Hopkins University.

Address of Professor William Henry Howell

MR. TOASTMASTER AND GENTLEMEN: Like everyone in this country who is concerned at all with medical education, I have been deeply and sympathetically interested in the great project that you have been carrying on here. The completion of these magnificent buildings is an event of real importance. Its significance to the nation at large, so far as medical interests are concerned, has been dwelt upon today by those who are best qualified to speak upon such matters, but there is one feature that has not been referred to which interests me especially and to which I should like to call your attention for a few moments.

I have in mind the influence which I hope your splendid equipment will exert upon the development of the so-called scientific subjects in the medical curriculum. We need professors in these subjects who shall be good teachers as well as good investigators, and of these two qualifications I should lay most emphasis upon the ability or at least the desire to investigate. The business of investigating or of making scientific discoveries is attended by many serious difficulties. In some ways it is like attempting to add a cubit to one's stature, for a man may give much thought to it without any appreciable result. One might say, in fact, that to get the best results in research there must be a happy combination of thought and chance. It is frequently stated, and I believe with much truth, that many of the most important discoveries in science have been stumbled upon by men engaged in quests that had an entirely different objective in view. We may accept this view as a partial explanation of the fact that so few great discoveries are actually made in spite of the large number of devoted and industrious investigators who are giving their best efforts to the attempt. If the making of an important discovery were an indictable offense I fear that most of us professors would have no difficulty in establishing our innocence. But so far as a teaching institution is concerned, the mere attempt, on the part of its professors, to make discoveries, is almost if not quite as important as actual success in the undertaking—for the value of research may be estimated from

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two quite different standpoints. On the one hand we may consider it from the point of view of a return upon investment. As a matter of fact we know that large sums of money are invested in our universities in men and material with the expectation that the development of knowledge will be facilitated thereby. It is natural and legitimate to regard this investment from a business standpoint and to make inquiry regarding the nature of the returns. Certainly everyone of us who is engaged in such work is delighted when he can demonstrate that his investigations have had some visible outcome of importance. No higher reward can come to a man than the consciousness that his labors have brought benefits to his fellow man on either the material or the spiritual side. In medical matters it so happens that tangible results of this kind have been frequent in our generation and promise to be more frequent in the immediate future. The facts and methods which have been developed through many years by investigators in the fields of physical and natural sciences are finding today a fruitful application to the study of disease, and I believe that this fact is recognized not only by medical men, but by intelligent laymen as well. Men with large means at their disposal and with a desire to use their fortunes for the betterment of their race are turning to medical research as to an enterprise that promises profitable returns upon money invested. This is the interpretation that may be put upon the tendency observed in this and other countries for the creation of large institutions

of medical research upon private foundations. I hope and confidently believe that this movement will be justified by results and that we will see in this country a steady increase in the number of these valuable institutions. The laboratories of our medical schools are engaged in similar work, but whether or not a large measure of success will be attained is, of course, a matter of some uncertainty. The quest for truth is a speculative enterprise, and there is always a chance of failure. But there is one return from such work for the medical school that is dead certain, and that is the beneficial influence it exerts upon the vitality of the school itself. A medical school should be a living, throbbing center of activity and inspiration, and that it will not be unless its teachers or a goodly proportion of them are engaged in research. A school may devise a complete and attractive curriculum and provide ample facilities for instruction, but if the spirit of inquiry does not animate its teaching body it will be a dead institution so far as any influence outside its immediate environment is concerned. The modern tendency among administrators in selecting their instructors to lay the greater stress upon ability to investigate is wholly justified. Something may be lost at times on the side of formal teaching, but it is more than compensated by the stimulating and activating influence that emanates from an inquiring mind. There ought to be, however, some kind of a psychological test to enable us to distinguish between the true and the pseudo-investigator, between the man who

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is an investigator by nature and the one who is an investigator from imitation or for some ulterior purpose. Men of the latter kind soon weary of the work. They are discouraged by the labor involved, or the time required, or most of all by the lack of success, for it is not in the nature of investigations to yield a large percentage of successes. Men who feel keenly the need of visible rewards for their labors are not likely to be happy as investigators. They would do better to embark upon less hazardous careers. As a professor I would suggest that men of this bent might have the making of good presidents or deans. The investigators by nature are men who cannot refrain from following out their ideas. They are driven constantly to such work by interest or by irritation; either stimulus is sufficient. I fancy that among our greatest investigators it is the irritative impulse that predominates. Lord Kelvin speaks somewhere in his autobiography of the restlessness and uneasiness that his ideas caused him until he worked them out of his system, and the internal evidence suffices, I believe, to indicate that Pasteur was afflicted in a similar way. His surging ideas kept him more or less constantly in a state of productive unhappiness. The condition is not difficult to understand. Great minds will have great ideas, and great ideas are not compatible with a peaceful, quiet life; they drive one into activity. The other group may be of a lesser order of magnitude, but fortunately they are more numerous and more easily found. They investigate chiefly because they enjoy the process, and,

therefore, whether the results be good or bad they get their reward and escape the discouragements of failure. They have something of the spirit of that sturdy sea captain who went whaling in the Arctic seas, but returned with an empty vessel. When a friend attempted to condole with him upon his misfortune he replied that it was all right, he had had a damned fine sail. Investigators of this type are the valuable and lovable men who give to a school an atmosphere in which the best qualities develop and flourish. If I were an administrator I should endeavor to get as many professors of this kind as possible, whether old or young, and never a one would I let go, partly for the reason that the chances are good that such men may make valuable discoveries, for those who succeed must be among those who try, but mainly because they constitute a living force that counteracts the dry rot or whatever the disease may be that so often saps the vitality of a faculty. Formerly in medical subjects men of this kind sought the laboratories of anatomy, physiology and pathology, for only in these subjects could facilities be obtained for investigative work—but latterly the conditions have been changing. The institutions of medical research offer positions that are better paid, facilities that are perhaps more complete, and above all, fascinating problems and adequate leisure unbroken by the routine duties and responsibilities of teaching. In our medical schools also the clinical branches are beginning to develop experimental laboratories and in connection with them to offer

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opportunities and positions that bid fair to outclass similar opportunities in the underlying branches. I have had some fear therefore that the supply of investigators may not suffice to meet all these new demands and that possibly the promising openings in the practical branches may make it difficult for the theoretical subjects to attract the right kind of men. We need in these latter departments the kind of investigating teacher that I have described above. The ideas and methods that are being used today with such success in the study of diseased conditions arose for the most part from the labors of investigators in the scientific branches, and it is probable that the ideas and methods that will be needed in the future will likewise be worked out first in the fundamental subjects. It would be a great disaster to medical progress if these posts should be filled by men who are satisfied simply to impart knowledge already acquired. In the process of evolution these chairs have risen to the dignity of full university professorships, and are entitled to all the rights and privileges thereunto appertaining. But it is obvious that these rights and privileges should be of the kind that will attract ambitious and capable men. The mere possession of a title, the privilege of writing a few letters after one's name, the right to don an academic gown on state occasions—these are not the things that make an appeal to the kind of man that I have in mind. The rights and privileges that count the most so far as the investigator is concerned, are adequate facilities for his work and reasonable leisure to devote

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to the pursuit of his problems. Now it seems to me that in planning these noble buildings you must have had this point in mind. You have accomplished a symmetrical development of splendid facilities for both the practical and theoretical subjects, and while providing for the newer needs have not overlooked the older ones. You have done exactly right it seems to me. I feel grateful for your action. My fears for the future underlying subjects will have no justification if all of our good schools follow your wise example.

Alumni Day

ON Friday, April 30, 1915, addresses of welcome to the Alumni were made in the Assembly Hall of the Medical School. Dr. John Blasdel Shapleigh, Clinical Professor of Otology, presided.

PROFESSOR SHAPLEIGH: The dedication of these buildings is an event so significant of results already achieved and so full of promise of still greater results to come, that it must arouse in every friend of the Washington University Medical School a feeling of pride in its past, and of confident hope for its future. Especially should it appeal to the Alumni, and create in them a greater love for their Alma Mater and a more earnest resolve to help in her larger development and usefulness. Therefore it is proper that in these dedicatory ceremonies a time should be specially set apart for formally welcoming the Alumni, and that this should be called "Alumni Day."

The Washington University Medical School of today is the result of the union and the taking over by the University of two of the oldest and best medical schools of this section of the country, the Missouri Medical College and the St. Louis Medical College, and so it is that of those who are now counted as Alumni of the Washington University Medical School some hold diplomas from the St. Louis Medical College, some from the Missouri Medical College and some from the Washington University. It is therefore a very appropriate and

graceful recognition of the worth and service of these two old and honored medical schools that a graduate of each should have been chosen to address you today.

I have the honor of presenting to you as the first speaker a graduate of the St. Louis Medical College, class of 1885, formerly Professor of Physiology in that school, but who was taken from us by one of the leading medical schools of the East—Dr. William Townsend Porter, Professor of Comparative Physiology, Harvard Medical School, who will speak on behalf of the St. Louis Medical College.

Address in Behalf of the Alumni of the St. Louis Medical College

BY PROFESSOR WILLIAM TOWNSEND PORTER

My first acquaintance with students of this institution was so long ago that I must decline to give the date. I was a small, imaginative boy. My father lived on the road to the City Hospital in a broad avenue along which came from time to time large droves of "guv'ment" mules—that distinguished quadruped. Or else came Texas steers, in hundreds, with a thunder of hoofs, a high crackling of drivers' whips, and the gleam of sharp horns in sunlit clouds of limestone dust. Often a distracted beast, fresh from the prairies, would rebel against civilization and seek what Mr. Henry James has called the larger latitude. Then there were loud

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cries of "mad bull," frantic gallopings, broken lamp posts, policemen in the rôle of St. George, and small boys with wildly beating hearts and half paralyzed legs.

On Wednesdays these annals of a quiet neighborhood were further relieved by students of medicine on their way to the clinic. We heard in the distance their irregular tramp on the brick pavements. We were children of nature, not of art. We did not whisper with white lips, "The foe! They come! They come!" but we had the right emotions. The sympathetic nervous system knew its duty and failed not. The hair rose upon our heads. Our tongues were dry and large, thus doing for nothing an experiment for which Claude Bernard was given a statue in France. We retired behind our stockade, known to us as "the front fence," conscious of a frightful lack of co-ordination between our valiant souls and our craven extremities, while in our ears drummed the appalling questions, Would they catch us? Would they cut us up? Nearer and nearer comes the dreadful throng. The leader reaches for his knife. What small boy would believe that there were creatures who always carried handkerchiefs—and used them? The knife! Panic, strangest of reflexes, tore us from our hold and drove us like leaves before the north wind. We burst through the house door, fled along the passage, rushed through the pantry, to the shrill sound of agitated tea cups, and in the safe and well-loved kitchen threw ourselves into the arms of Aunt Jane, a distinguished practi-

tioner of what was then exclusively a Black Art. In those ample arms, we found, as always, sympathy and a perfect knowledge of the world. "Sure, Honey, dey only cuts up niggahs." Ah! happy thought. Ineffable relief! Undisturbed at that date by the reflection that there might be something wrong with a society in which the envelope counted for so much and the contents for so little.

Years passed. I was now a schoolboy, creeping with shining face to the Lincoln School, when one day a medical student, with kindness quite mistaken, asked me to go with him to the surgical clinic at the City Hospital. We joined a shuffling crowd at a door opened grudgingly by a sour man, darkly certain that we were a race apart, strangely unconscious that his instinctive antagonism had come down from times, not very remote, when medical students were set apart from common folk by extraterritorial rights.

We crossed the threshold into a new world, into a House of Pain. Long, shining corridors stretched before us. Through open doors we saw the polished wards, with their rows of trim beds. The clinic was held in an amphitheatre in which the seats rose tier on tier. They were painted brown. Below was the operating table, flanked by steam coils from which a mist of carbolic acid could be thrown over surgeons and patient. Young resident physicians stood about in important attitudes. Nurses went to and fro. There was a subdued murmur of talk, while over all hung the air of an approaching event. Suddenly a quick step was heard. The

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little noises were hushed; students, attendants, the details that had been so clear, seemed suddenly to fade, and there stood before us the chief surgeon, John T. Hodgen, dark, strong, iron-willed, kind. To him came forth a young lad, scarcely twenty. He was laid upon the operating table. A few incisive words and the work began. Even now I hear, in my dreams, that cry of anguish:

“Doctor! Doctor! Please! PLEASE!

How little do we realize the suffering of those days! Had medicine done no more than to remove these agonies, how great would have been its service!

Again years passed. I was now a student in the St. Louis Medical College, a volunteer assistant to Dr. Friedman, in the chemical laboratory, a dingy, dusky cavern, in which the white head of saintly old Dr. Litton shone like an alabaster lamp. I washed the beakers, made oxygen for the demonstrations, and took private lessons in the atomic theory, accepted by us as a primeval fact, despite its name. Father Litton was not devoid of humor. At times he would say, “Jump up on the table, Friedman, and show them there is no hocus-pocus.” As the table was about four feet high, this kept the Demonstrator of Chemistry in excellent training. Dr. Friedman was my first teacher in medical science, and I can say, with truth, that I have rarely found a better instructor. There was what we called a “quiz” that was especially valuable. It was held from seven to eight in the evening. We sat on both sides of a long table in what was after-

ward the physiological laboratory. Dr. Friedman was very skilled in detecting impostors. He would ask the same question of one man after another. I recall that he once asked Jules Vallé the color of metallic arsenic. Vallé, who was an admirable student, replied that it was black. The question passed to the next man. Quite deceived by Dr. Friedman's manner, this man said it was yellow; the next said white. As the terrible question pursued its devastating way, the spectral colors were soon exhausted. Finally it came to a student who, seeing nothing left for him, replied that he "guessed metallic arsenic must be kind of speckled."

Together with Dr. Litton, Dr. Baumgarten, a much younger man, was greatly loved and respected. I used to pray that I might grow up to be such a man, not realizing how much I asked. Dr. Baumgarten imparted to physiology an indescribable air of good breeding, an influence likely to remain with me. Even now, I never address this subject without taking off my hat.

The instruction in medical schools thirty years ago was mostly an exercise in memorizing, properly belonging in the elementary grammar school. We students played at "stumping" each other, such was our elegant phrase, by means of the index of Gray's anatomy. There were one or two anacondas in our midst who had actually swallowed the whole revolting mass. Three winters of dissection, and some minor experiments in chemistry, were but partial antidotes to this injurious didactic method. The mischief done will be appreciated

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when I say that we all supposed that only geniuses like DuBois-Reynard could perform the physiological experiments which are now done by every student from St. Louis to Beyrout, Manila and Tokio.

The examinations varied with the temperament of the instructor, and with his personal knowledge of the student. The examination in physiology was long and searching. Dr. Baumgarten told me that in seventeen years he had given the mark of 100 but four times. I shall always remember my appearance before dear old Dr. Johnson, Professor of the Theory and Practice of Medicine. He, you remember, was a tall old gentleman, with beautiful silvery hair, and a distinguished presence. "Sir," said he, "what is the difference between a sign and a symptom?" I answered as best I could. "Ah," said Dr. Johnson, a slight twinkle in one eye, "And are you still boarding with Mrs. Brown?" This was one of the few examinations in which I felt sure of 50 per cent.

The position of resident physician in the City Hospital was the goal of all medical students in the St. Louis of that time. There was an interval of about six weeks between commencement and the competitive examination for the coveted positions. Meanwhile, three men were appointed pro tempore, to live in the hospital and learn what they could. This was esteemed a valuable privilege. One of my classmates got his appointment through the governor, another through the mayor, and I was in despair, not knowing these dignitaries, until it transpired that the health commissioner had

been, in the Civil War, the general commanding the brigade in which my father had been chief surgeon. In those days this was an excellent reason for appointing me physician to the hospital.

The public examination for the hospital was a test of endurance. We wrote all night, beginning at seven o'clock. The successful candidates, except one, happened that year to be all from the St. Louis Medical College, which gave us great satisfaction in those silly internecine days.

I entered the City Hospital in 1885. The advance in medical and surgical knowledge since that day is almost beyond belief. We had hundreds of patients with tuberculosis. Not one recovered. Moreover, we were firmly convinced that no one could recover. The abdomen was almost never opened, because the operation was almost invariably fatal. Many of the women confined in the hospital died of puerperal fever. So far as my recollection goes, not a single bottle-fed baby survived. Diphtheria became, at times, a scourge. Typhoid fever claimed yearly scores of lives.

The weakness in the medical work of those days was its lack of systematic experimentation. Except in anatomy and chemistry, there were no laboratories, and even in these subjects the laboratories were only for dissection and for elementary instruction in the inorganic analysis. I, myself, founded the first physiological laboratory in St. Louis; indeed, the first physiological laboratory west of the Atlantic seaboard. It consisted of one room, in the second story of the building in Clark Avenue. Just

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across the alley, sixteen feet from my window, was one of the lowest dens in the city, a vile and noisy place. The old college was inhabited by immense Norway rats. They had a runway across my laboratory. I worked at night, holding then the fallacy that more work would be done with a dull axe in twelve hours than with a sharp one in eight. I could often hear a rat come heavily down the back stairs. One night, about ten o'clock, I was asleep before a book propped up on a small table bearing a kerosene lamp, when a huge rat ran over my foot. I woke in a great fright, but seized the lamp with one hand just as it was turning over.

Such was the early state of physiological science in this community.

I have been given the pleasant and the very honorable privilege of welcoming to this celebration the Alumni of the St. Louis Medical College. This is a memorable occasion; memorable because it marks the fruition of long-cherished hopes; because it crowns long years of patient endeavor. In this world, so cruelly scarred by war, so foolishly set on the pursuit of material success, it is noble to place on high the ideal of unselfish public service, the purpose of an institution that shall skillfully train men to spend their lives for the common welfare, to still the cry of suffering, to find, through reason, the remedies that conquer the ancient enemies of mankind, to discover laws by which generations still unborn may live, year after year, century after century, in greater happiness and peace. Such was the purpose of the fathers of this

institution. Like Columbus, they believed in a new world. Like Columbus, they ventured forth upon an unknown sea and kept their way in spite of timid souls and selfish counsel. Their hearts went on before them as they sailed.

This is our heritage. It is for this that we return today with love and pride.

PROFESSOR SHAPLEIGH: It is scarcely necessary to introduce to a St. Louis audience the gentleman who will address you on behalf of the Missouri Medical College. A graduate of that school of the class of 1895, he has devoted himself to one of the fundamental branches of medical science, and as teacher and investigator in that branch has won for himself a recognized place among American anatomists—Dr. Robert James Terry, Professor of Anatomy, Washington University Medical School.

Address in Behalf of the Alumni of the Missouri Medical College

BY PROFESSOR ROBERT JAMES TERRY

It is my privilege to welcome the alumni of the Missouri Medical College on this day, when we have met to commemorate an epoch in the history of our organization. I cannot do better than to recall some of the significant movements connected with the school, which, together with influences of the St. Louis Medical College, have led directly to our present relation, one of the components of Washington University. The reader of St. Louis

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medical history is impressed with the magnitude of work accomplished by the profession in the early days. The organization of our schools, hospitals, societies and journals was performed under adverse conditions such as never again will be found in the world; and the institutions are here today developed to splendid usefulness.

Kemper College, a Protestant Episcopal institution, incorporated under the laws of Missouri in 1837, was the first to offer medical instruction west of the Mississippi River. The leading spirit in the organization of the medical department was Dr. Joseph Nash McDowell. The first course of lectures was given in 1840-41. The building, located on Ninth and Cerre Streets, in St. Louis, contained an amphitheatre, a room for practical anatomy, a chemical laboratory and other rooms. The equipment comprised an anatomical museum and chemical apparatus. Clinics were provided by the City Hospital and Workhouse. The original faculty numbered six: John De Wolf, Professor of Chemistry; Richard Barritt, Professor of Materia Medica and Physiology; John S. Moore, Professor of Theory and Practice of Medicine; Thomas Barbour, Professor of Obstetrics and Diseases of Women and Children; J. B. Johnson, Professor of Pathology and Clinical Medicine; Joseph N. McDowell, Professor of Anatomy and Surgery. The course was two years, besides two years of private pupilage. On the financial failure of Kemper College, in 1845, the medical school became, by act of legislature, the Medical Department of the State University.

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At this time the published names of alumni numbered seventy-three.

For a second time the organization established by McDowell began activities within the walls of a university and continued in this relation for ten successive years. It was during this period that the large building on Gratiot Street was erected and occupied. While this edifice reflected some of the eccentricities of the founder, it gave evidence of careful planning for immediate and future needs of teaching. Considerable addition to the teaching apparatus was made at this time. The personnel of the faculty underwent some changes, the names of Charles W. Stevens, Edward H. Leffingwell, John Hodgen and Payton Spence appearing. Increased advantages for clinical observation were given by the Marine Hospital and City Dispensary in addition to those institutions with which the Medical Department of Kemper College had an agreement. Another year of pupilage under a preceptor was added to the requirements for the degree. The classes during this period gradually increased, in 1855-6 reaching one hundred and three, of which twenty-nine were graduated.

In 1855 a charter was obtained for the medical school which created it an independent organization, the Missouri Medical College, with Archibald Gamble, Thomas Watson, Wm. Millburn, Dr. John S. Moore and Dr. Joseph N. McDowell, Trustees. Requirements for graduation, as found in the catalogue, are stated more explicitly than in the past. A great advance in clinical opportuni-

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ties was made at this time by the housing of the City Dispensary in the building of the Missouri Medical College. Although no classes were graduated during the period of the war of the states, instruction was continued by certain members of the faculty, notably by Hodgen. McDowell's unneutral words and acts led to the confiscation of the college building and its use by the United States Government for a military prison. The class graduated in 1861 numbered twenty-six.

Immediately after the war McDowell began the reorganization of the Missouri Medical College, but, his death occurring in 1868, the founder did not witness the great development of the school which was under way in the early seventies. The faculty which then took up the work included several newcomers to St. Louis. Among the names are those of Shumard, the paleontologist; Curtman, a worthy student of Liebig, and Paul Gervais Robinson, the brilliant diagnostician. In the announcement for 1871-72, microscopes and microscopic projection, as a means of teaching histology, are mentioned; also making of post-mortem examinations by the students. Practical work in obstetrics was afforded by a lying-in charity. In addition to clinical provision in the past, there appear in the catalogue of 1872-3 the Insane Asylum, St. Louis Eye and Ear Infirmary, St. Louis Western Dispensary. During this period of reorganization temporary quarters were occupied on Sixth Street, but in 1873 an affiliation having been established with St. John's Hospital, a commodious college

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building was erected on Lucas Avenue adjacent to the hospital and subsequently connected with it by a clinical building. This effort to secure a hospital, crowned with success, may well be regarded as an epoch in the history of the school. The Lucas Avenue Building, in which most of us here today have studied, was the home of the college for twenty-two years, during which period a connection was again established (1886) with the University of Missouri. By this relation the fundamental medical studies could be pursued in either institution; while the clinical work was provided by the St. Louis section. A graded course of three years, which had been advocated for some time, was inaugurated in 1889-90; the term was also lengthened and the spring course improved upon. Internship in the City Hospitals was encouraged.

We recall how, in the St. Louis Medical College, laboratory teaching was dominant, and in the Missouri school, clinical instruction was emphasized.

For the building up of a large surgical clinic at that time the school is indebted to the devoted work of Theodore Prewitt and Herman Tuholske. The special clinics began to be cared for during this period; Michel, Bauduy, Todd and Hardaway were then entering upon careers which have contributed richly to their special fields. The St. Louis Post-Graduate School of Medicine united with the Missouri Medical College in 1891 and added clinical facilities through its Polyclinic Hospital. One result of good service given by St. John's and the Polyclinic, on Jefferson Avenue, was the establish-

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ment of a clinical center to which patients came from every part of the city. St. John's later moved into new quarters on Locust Street, and subsequently became affiliated with the St. Louis University. The Polyclinic became the Washington University Hospital and Dispensary.

In 1894 the school moved into the modern edifice on Jefferson Avenue, erected in connection with the Polyclinic building. We recall the flourishing condition of the college in its new quarters: good laboratories, new equipment, a large clinic and enthusiastic faculty. But it was clear that the fullest development of the school could not be attained by continuing as an independent institution. The advantages of university connection were strongly impressed upon the trustees and faculty, and in 1899 our organization passed into Washington University, joining forces with the St. Louis Medical College. "This union of the two oldest and most representative of the medical colleges in the West was undertaken and successfully consummated solely in behalf of a broader and more thorough training;" this statement is the expression of the motive for the union, to be found in the announcement of the combined schools at that time.

Let us now consider a few peculiarly interesting features in the history of the old schools. One striking feature was the frequent interchange of faculty members between the two St. Louis colleges, which, at all times, exhibited a keen rivalry toward each other. Members of McDowell's faculty would enter Pope's faculty, as in the cases of

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C. W. Stevens, J. B. Johnson and others. Prewitt and McPheeters, at first associated with Pope, later joined with McDowell. John Hodgen, the most distinguished alumnus of the Missouri Medical College, for years a teacher in the McDowell school, became, after the war, a member of the faculty of the St. Louis Medical College. T. I. Papin, a graduate of the St. Louis, joined with the faculty of the Missouri Medical College and gave to it St. John's Hospital. It is also worthy of remark in this connection that, following the war, men from both the North and South mingled in the Missouri Medical faculty: P. G. Robinson was surgeon in the Confederate Army; Bauduy, surgeon in the Union Army. These circumstances seem to indicate that the making of a good medical school was an object well worth the submerging of strong personal convictions. Again, the appreciation of the value of university connection deserves notice. This feeling was dominant in the organization four times throughout its history. It is evident in the founder's establishment of a medical department of Kemper College; in the two affiliations with the State University, and finally in the recent union with the St. Louis Medical College as the Medical Department of Washington University. The organization has been a university department during about half of its existence. Whatever force there be in the criticism on the several relationships assumed by the organization which is now a component of Washington University, it should be remembered that our medical school is not unique

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in its career; indeed, it would be difficult to find a contemporary school whose status had not varied in like manner. We recognize that the changes of status in every case were rewarded with substantial gain; with each step an increase in educational advantages was secured. The union of the St. Louis and Missouri Medical Colleges was an expression of high moral obligation to the interest of medicine. In this movement great personal sacrifice was anticipated and experienced, but it did not deter, nor was any feeling allowed to stand in the way of the progress of the plan to improve medical education. The faculties, students and alumni of the two schools united in elevating the standards of work, and today find the realization of their labors.

Such, in brief, has been the development of our school within the walls of college buildings. Let us review now the history of the organization founded by McDowell, away from the school, i. e., the organization in its relation to the community. We turn then from the consideration of the teaching of medical students to an examination of the work which teachers and alumni have contributed toward the formation of those institutions providing for public welfare or which are instrumental in advancing and disseminating medical knowledge.

There are two ways of estimating the value of a medical school: by measuring the facilities for study and by measuring the output. The value of the output is the primary consideration. What our alumni do is the true measure of the worth of

our school. What do our efforts, in selecting and training students, give the world? Some idea of the spirit and character of the work of graduates and faculty may be got from a study of the medical history of St. Louis from the time of the foundation of Kemper College. No alumnus of the St. Louis and Missouri Medical Colleges can read the history of the public charities, hospitals and medical societies of this city without feeling proud of the part taken by his school. Let me mention the origin of a few of these institutions. The City Dispensary was provided by ordinance after five years of unselfish work given to the establishment and maintenance of this necessary public charity by a small group of men connected with the two old colleges: S. G. Moses, Wm. McPheeters, George Johnson, J. B. Johnson, C. A. Pope and Joseph Clark; Wm. Beaumont and Hardage Lane were consulting physicians. A clinic room was provided in the basement of the Unitarian Church, on Ninth and Olive Streets, by Rev. Dr. William Eliot. Dr. John S. Moore and Dr. M. M. Pallen, health officers, were the first appointed to have charge of the City Hospital, and of those who subsequently held this responsible position and contributed to the development of this institution to its present usefulness, many graduates of our school may be counted. In the case of the Female Hospital, in its early years, the studious work of Dr. P. V. Schenck will long be remembered. McDowell's determination and influence were exerted in locating the U. S. Marine Hospital near St. Louis;

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R. A. Anderson's name is associated with the early history of the Quarantine Station. St. John's Hospital was established and was for thirty years controlled by the Missouri Medical College. It had its beginning in an infirmary for women and children, suggested to the Sisters of Mercy by Dr. Papin and Dr. Yarnall in 1871; buildings were erected on Twenty-second and Morgan and later on Twenty-second and Locust Streets as the increasing service demanded. Today the hospital occupies the large and beautiful building in our neighborhood. Bethesda Hospital, with its several departments, was founded and is maintained as a charity through the efforts of Dr. E. W. Saunders.

As in the domain of public sanitary work, so in the field of medical societies and publications the teachers and alumni of the two old schools entered with zealous spirit. The first officers of the St. Louis Medical Society, established in 1850, were B. G. Farrar, President; Hardage Lane, Vice-President; B. B. Brown, Recording Secretary; J. B. Johnson, Corresponding Secretary; Y. D. Bolling, Treasurer. One of the most active organizations was the old St. Louis Medico-Chirurgical Society. Prominent in the founding of the "Medical Club," as it was called, were graduates of the St. Louis and Missouri schools. Transactions were published in the St. Louis Courier of Medicine; a good library was secured. The Courier of Medicine was the outcome of the efforts of an association formed by John Hodgen, W. A. Hardaway, H. N. Spencer, P. G. Robinson, G. A. Moses and J. P. Bryson. It

was at first edited by A. J. Steele and W. A. Hardaway. The influence of the Courier and the Medico-Chirurgical Society is justly entitled to praise. Of the several medical clubs in St. Louis, which have formed in later years, none has exerted so stimulating an effect upon the medical profession as did this old society. The St. Louis Medical and Surgical Journal was established by Dr. Linton in 1843. Some years later the Missouri Medical and Surgical Journal, edited by Stevens, McDowell and Barbour, was merged with it. In the development of the St. Louis College of Pharmacy, two alumni of the Missouri Medical College have taken a conspicuous part: O. A. Wall and H. M. Whelpley.

These references to some of the work of our school in the community give an idea of what our organization has accomplished and of the interest and spirit underlying and urging on similar activities on the part of our alumni in fields away from St. Louis. The example given by the old teachers of earnest devotion to professional work, and the manifest desire to keep informed of the progress of medicine made good and lasting impression upon the students. These men were not contributors to medicine in the sense in which we use the term today, but their work was indispensable, was in direct relation to the urgent problems of the place and day, and it was well done.

Finally let us consider for a moment the significance of this occasion. We alumni, in company with friends from many institutions, are experiencing the deep satisfaction of another great step

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taken. We can look back and fancy such feeling in our predecessors when the school, a department of the State University, entered the new building on Gratiot Street, and later on the acquisition of St. John's Hospital.

In 1909 Charles Sedgwick Minot, Professor of Comparative Anatomy in the Harvard Medical School, came to St. Louis to deliver the valedictory address at the Commencement of the Medical Department of Washington University. His subject was "Certain Ideals of Medical Education." We could not hope, at that time, for such immediate realization of his views as are here before us, yet his words were a great stimulus to work and must always be associated with this latest evolution of our school.

The occasion is significant to the man who conceived of and made possible this great step in the progress of medicine in signaling the successful completion of his project. To Robert S. Brookings medical progress owes a great debt.

The erection of a group of buildings and the reorganization of a faculty is work whose ultimate success is dependent upon the harmonious interaction of many factors. Much depends upon the attitude of the community in which such work is proposed. This day gives evidence of the desire on the part of St. Louisans to raise the standards of medical education and practice to the highest possible level.

This day is one of rejoicing on the part of our officers and faculty as they are brought to realize

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something attained from the plans and hard work of the last five years. These plans had to assume for their success, not only an amount of sound work accomplished by the two old schools within and without their walls, but a reliance upon a sympathetic understanding of their object and motive. When we pause to think how much is now involved of educational and moral worth to our school, and to this community, and to medicine, we must feel that as alumni it is our duty, as well as a privilege, to aid as we may the future progress of this undertaking in which our school entered three quarters of a century ago.

DOCTOR SHAPLEIGH: The next address, on behalf of the Washington University Medical School, is to be given by a member of the Faculty. It may therefore be considered as the official welcome of the Directors of Washington University to its medical alumni, but I am sure that I voice the feeling of the Directors in saying that the welcome is not meant only for those who hold diplomas from Washington University, but includes as well those whose diplomas bear the seal of the St. Louis or of the Missouri Medical College, since it is earnestly desired, that these too consider themselves as alumni of Washington University. I take pleasure in introducing Dr. Fred Towsley Murphy, Professor of Surgery, Washington University Medical School.

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Address in Behalf of the Alumni of
Washington University Medical School

BY PROFESSOR FRED TOWSLEY MURPHY

To welcome you is a pleasure and a privilege. From the two preceding speakers you have had, as it were, a welcome from the forebears of the school as it exists today. It is a goodly heritage which has been given to us, and we are proud of it. Only we must insist that you of the Missouri branch, and you of the St. Louis branch, are no longer Missouri or St. Louis men; you are alumni of Washington University.

These speakers have told you of the past developments much more interestingly than I could, for they lived in the time of giants and know whereof they speak. For me, then, there remains to be said but a welcoming word from the present faculty. This welcome I give you with all my heart. Your presence here bespeaks your interest in our work. This interest we need—need perhaps more than you realize. Individuals and groups of men everywhere and in all times have done their best work when they have felt the supporting force of tradition and kindly sympathy behind them. Napoleon called upon the twenty centuries to look down upon his troops in Egypt because he knew, as do we, that men do things because they are able and want to, and because of the belief of someone else in them. You link us with the past—make for us tradition. Your support is a compelling force for good.

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The purpose of these ceremonies is to dedicate, formally, these buildings to medical education, and in so doing to place before the world the standards for which Washington University Medical School stands. Of these hopes and ideals you have heard much. In my word of welcome it would not be fitting to dwell at length upon problems of medical education, yet at this time I cannot fail to comment upon certain features of our growth. You may see the buildings; they are magnificent; as a working unit, perhaps the equal of any other group in the whole country. The equipment, too, you will find adequate. But you realize, as do we all, that the buildings, essential as they are, are the least important part of a great medical school. It is that deeper vital force which is fundamental, just as it is that something which has been termed an "atmosphere" about a library, which makes the university great. To make this more concrete, I should say that these vital forces are the ideals which make the members of the school, both students and teachers, consider above all else service, and fearless and painstaking industry in their search after truths—truths which may add to the sum total of medical knowledge and human happiness, whether they be applicable to the care or the prevention of disease, or may, for the time being, have no direct bearing upon disease. Service in this work, as real service anywhere, means sacrifice. But what examples of service and sacrifice members of your body have been! To know Dr. John Green and Dr. Washington Fischel has been your privilege for years, and I

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am sure that no greater reverence is paid their memory by you than by us. Whatever the time or the school, such men are an inspiration and leave their imprint. They struck hard blows for the right as they saw it. They were tireless workers, deeply interested in everything that pertained to the development of this school. They recognized the call of service in this community. Each went to his end with pennons flying, examples to the end of life of steadfast courage and devotion to service. I mention these two names because they lived to stamp their opinions directly on the last development of the school, and I would, by this mention, pay homage to the past.

Since the student days of many of you, the curriculum has been changed in an amazing way. The didactic lecture has become almost a thing of the past, and has been supplanted by the more intimate case-teaching method. The men spend much time in actual laboratory investigation where the student sees actual conditions rather than, as in didactic instruction, hears about them. This change in method does not, however, mean a change in purpose. One of the great eastern secondary schools, established something over one hundred and twenty-five years ago, was, to quote verbatim from Gov. Phillips' letters, founded "to learn boys the business of living." The purpose of the medical school of today, just as of the medical school of the past, is to teach men how to care for the sick and how to prevent sickness, and to lay a strong foundation which will meet the demands of whatever field

of investigation may be entered. In the loose talk of the public about modern medical education, there sometimes creeps in the erroneous idea that now the consideration paid to the actual care of the sick is minimized, and that attention is focused on research. Desirable as research is—be it in clinic or laboratory—it must be looked upon as the special development of the chosen few.

I make this reference to the purpose of the teaching of the school in order that you, of the graduate body, who are not in sufficiently close touch with the work to draw your own conclusions, may be assured that our first endeavor is to prepare the men to be sound students and practitioners of medicine. I propose also to comment upon certain misconceptions of the relation of the dispensary of the Medical School and the affiliated hospitals to the public. The three vital purposes of a great hospital are to care for the sick, to assist in the training and education of students, and to contribute to the advancement of medical knowledge. These are the principles which have been considered, and only these, in organizing the dispensary and the hospital services. In accepting these responsibilities, the institutions of necessity become responsible for those in charge. Therefore, the privileges of service were accorded only to such men as were active in medical teaching, and who, in the opinion of those competent to judge, possessed special fitness to meet the demands implied in the accepted principles.

The organization has been as comprehensive

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and the service as extended as the material and the means available would allow. The care of the sick has been interpreted as including not only the actual treatment in the dispensary and hospitals, but also assistance in correcting the home and industrial conditions which might be at fault. In order that the greatest service possible might be rendered to those in need, and that the self-respect of the patients might be preserved, every effort has been made to conserve resources by insisting that those who can pay for service shall pay.

Unquestionably, the service which such a group of men and institutions can render to the community is as yet largely unappreciated and undeveloped. In working out these problems the University and the hospitals propose to exercise the greatest care that the best traditions and ethics of medicine shall not be violated, but in weighing any problem, need and service will be considered before privilege. In the development of medicine, inefficiency and selfishness have never been protected, and in so far as this group of men and institutions can serve the public, it is not proposed that this service shall be dwarfed because of senseless prejudice.

To work out these problems, we need, as I said in the beginning, your help, your friendship. Last winter I found at one of the student banquets a little couplet which ran: "Fight your battles for you, take your part when you are wrong, because I am your friend." It seemed to me then, and it seems to me perhaps more today, that this couplet

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contains a mighty truth—a truth which will have great influence upon our development as a great medical school. With you fighting our battles for us, taking our part when we are wrong, because you are our friends, and I might add because you believe in us, is going to bring something to this work which is vital, vital in every way, in influencing students, in influencing the community, in influencing the actual work done. Let us go forward with a solid front—the alumni of the Washington University Medical School—the differences of the past forgotten and buried, the hopes for the future united and glorious.

At the conclusion of the addresses the alumni visited the laboratories and library of the Medical School.

At 1 P. M. a luncheon was given to the delegates and alumni in the refectory of the Medical School.

At 2 P. M. addresses were made on the lawn of the Medical School between the North and South Laboratory Buildings. Dr. Eugene Lindsay Opie, Dean of the Medical School, presided.

DEAN OPIE: The speakers this afternoon are representative, the one of medical practice, the other of preventive medicine. The professor of medicine in this school has been a student of disease in many parts of this country. He has been an instructor of physicians in Pennsylvania in the East, in Mich-

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igan in the North, and in Texas and Louisiana in the South. He speaks with authority on medical education. I have the privilege of presenting Dr. George Dock, Professor of Medicine in Washington University.

The University Hospital and the Community

BY PROFESSOR GEORGE DOCK

There are many types of hospital organizations, and something can be said in favor of almost every type. It is especially of the hospital with academic connection that I wish to speak, for the Washington University Medical School, whose carefully planned buildings we are now dedicating, enjoys affiliation with two hospitals, each one planned for correlation with the medical school, and for the exact purpose that each can play in the complex work of medical education. How close the physical relation is can be seen very easily. The hospitals join on to the part of the medical school where the transition subjects between the fundamental and the clinical branches are cultivated. The arrangement is such that the work that can best be done in the hospital is done there, while other functions are carried out in either the pathological building or some part of the laboratories across the street. For more than two years the hospitals furnish the chief work-place for the medical undergraduate, and they are so planned that there is ample room for individual apparatus, hospital clothes and everything else needed within a few steps of the wards, operat-

ing rooms and laboratories, where many of the working hours are spent.

So admirable an arrangement makes for efficiency and must benefit the community in which it exists in many ways. The thorough education of physicians enriches first of all the city in which such work goes on. It becomes a medical center, a medical Mecca. In the past, in a stage of educational development fast disappearing, this was not so. Medical schools were so numerous and at the same time so poorly equipped as to bring ridicule, if not worse, on their home cities. In the schools now growing into greater usefulness the effect will be different. Young men of talent and industry will be attracted; they will form ties of various kinds; they will become admirers of the civic spirit, exert an unseen but powerful influence if they leave, and if they stay, as many will, they will form a valuable part of the population.

But it is not of this part of the influence of a hospital I wish to speak, but of some other features.

In order properly to educate the undergraduates a large, well-trained, highly-specialized and highly-organized staff is necessary in an academic hospital. This staff has two functions, both important, both interesting. One, the care of the sick, including every part of the work, from ascertaining the nature of the various diseases to relieving them, and advancing, by every means available, the knowledge of their cause, nature, relief and prevention. The other, the advancement of scientific knowledge in general and of practical efficiency on the part of

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medical students. It is idle to discuss the relative value of these functions, chiefly because the responsibility and the time for each varies from case to case. The significant fact to the community is that the hospital has a corps of well trained, enthusiastic physicians, all working together, all working in the full light of criticism of those above, below and on the same plane. The endeavor always and unconsciously is to get the most exact information, to apply the most certain and appropriate treatment, to see that every one—patients, medical students and others—learn the lessons furnished.

From this fact it follows that an academic hospital inevitably becomes a center for graduate instruction; that is, for the broader and deeper education of many besides undergraduates. The house and externe staffs are, of course, graduate students. Guests and volunteer assistants appear. It is not necessary that formal courses be offered. Rather better is it to have men working at definite problems or obtaining special facility in an individual way as long as need be. This has always been done in every great hospital, and even our national tendency to classification of work and rigidity of fixed hours cannot prevent it. Such a development also will benefit the community in which the academic hospital is situated. The increased knowledge and efficiency cultivated in the hospital will permeate the profession, which, in turn, will stimulate the hospital constantly to greater endeavor.

But there is still another feature—the ability of the academic hospital to make its benefits accessible

to all who need them in a medical way. It is an important fact, though commonplace to the point of neglect, that health is the most valuable possession one can have. It is important to the individual, and by the modern co-operation and growth of social interdependence it is important to the community. In the organization of agencies for maintaining health and for keeping up physical and mental efficiency, hospitals hold the most important place—the strategic points, as it were, in the battle of health against all its seen and unseen foes. The reasons for this are not far to seek. We have now a good deal of positive knowledge about diseases, how they occur, the ravages they produce, how they can be combatted, the detection and prevention of their serious effects on the sick. We know these things, and we also know that their application requires work—that is, time as well as skill. Through ignorance or carelessness any one of a number of serious diseases may be acquired in the fraction of a minute. Their exact and prompt detection is of vital importance to patient and community.

Much of this can be done on a large scale, without hospital services, as in the search for diphtheria in a school or asylum, the detection of the earliest evidence of smallpox in a shop or railway service, of typhoid fever in a barracks. All this is essential for the community, but for the individual suspect there is something much more important and more difficult—the complete clinical examination, made with rapidity, thoroughness and certainty, while

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at the same time everything essential is being done for the patient as regards rest, diet and the relief of suffering. Only a modern hospital, with a fully equipped staff, can do all that is indicated.

The duty is still more serious in many organic and functional diseases, so that many days filled with the work of several investigators may be required to clear up the future of a diabetic, an anemic, a case of disease of the appendix or stomach, of the intricately co-ordinated glands of internal secretion, or of any one of a number of other parts of the body. The rich, that is those who have enough for the daily expenses of living, can get all these services, but the large majority of individuals cannot get the attention they need, unless they can have the services of a staff of experts provided at a nominal fee. Now no more economical way can be found to do this work than in the daily activity of an academic hospital. The task can be apportioned among many hands, covering various problems. The patient pays for his information by furnishing, at the same time, specimens for study and a topic for instruction.

Some details may need explanation. It may be thought that so much work is not necessary. Many people have an idea that a brief examination of a specimen, a throat culture for example, a test for tubercle bacilli, will suffice. Such examinations, as has been said before, have their value and will continue to be used, but we must distinguish between the result of positive findings of isolated facts and the complete examination that the patient always needs.

Laboratory examinations, made by people who have only a remote interest in the matter, often on specimens imperfectly prepared or selected, are notoriously prone to error. It is neither rare nor strange that in diphtheria work on a municipal scale as much as 25 per cent of examinations are faulty; in tuberculosis the discrepancy is even greater. These statements do not serve as destructive criticism of laboratory work. Laboratory experts have often protested against the unwarranted expectations of many who employ them. The laboratory examination is essential, but it must be known how solid, in each case, are the grounds for an accurate report. Most of all, all laboratory examinations are intended for definite and circumscribed facts. In each clinical case many other facts come into consideration. With the diphtheria patient the existence of the bacillus is essential for accurate statistics, and for early specific treatment, but even then it would be better for the patient to have the heart, lungs, kidneys and nervous system thoroughly examined in the beginning. In the case of the tuberculous subject, the sputum examination has great importance, but it is trifling compared with the necessity of knowing the anatomic damage and the precise functional value of each organ, for it is only with such knowledge that treatment can confidently and accurately be carried out.

Of course, hospitals are not the only places where exact, painstaking and skillful examinations are possible. The latter can be and are made by private physicians. In no city are there so many

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hospitals that physicians with spare time can have their efforts limited by hospital admissions. The material and apparatus needed in such work, moreover, are costly, and not every young doctor, no matter how willing, can do as much as he would like. And so there remain many cases appropriate to the academic hospital, as well as to the others.

The situation as regards treatment is much the same. Changes in knowledge have made the old expectant treatment as well as the older quick prescription writing wholly inadequate. From the standpoint of immediate and remote preventive treatment, patients with organic diseases, like pleurisy, pneumonia, rheumatic fever, even tonsillitis, and a host of others, require many and various examinations, as well as daily care, with the use of costly apparatus. In many cases, even with the best will in the world, the practicing physician cannot devote the necessary time to the patient. Here the hospital comes in, and here, too, the patient pays for part of this experience by furnishing material for study, teaching and investigation.

It may seem that so thorough and complicated a service cannot easily be made accessible to those who need it, but experience shows that the difficulty is not as great as might be supposed. Every medical school has a body of alumni and of other friends who understand how the service may be secured, and when it need be sought. The hospital becomes a court of last resort for a large number of people. Nor must it be supposed that it is appealed to only in hopeless or obviously obscure

cases, or those of the greatest severity. Partial disabilities of all kinds, functional and organic, will be referred to the hospital, but will be found not to require care in the institution. For this particular detail the out-patient department has been arranged to do the required work as rapidly and as thoroughly as possible. It is organized so that not merely the helpless can be treated there, but that physicians can refer their cases requiring extensive examinations not otherwise possible to secure, themselves carrying on the treatment of the patients, just as in any consultation.

Two points require a brief discussion. One is in regard to the treatment of those who are not obviously paupers. It is sometimes said that the provision for such examinations and treatment as I have described, in the hospital or in the out-patient department, involves certain wrongs. It is said that on the one hand it pauperizes the community, and on the other hand takes away fees that should go to the medical profession. To discuss the latter point first, in the cases under discussion no fees are lost. The patients have money enough for the writing of a prescription by a doctor; they have money enough to buy the medicine called for by the prescription; but they cannot pay for a thorough physical examination, for a complete examination of their blood, secretions and excretions; they cannot pay for the repeated examinations during treatment. If some charitable physicians wish to furnish all these things without compensation, they, of course, have that right, but it

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is not always possible for the patients to find a doctor with time and inclination to do the work. From a broad, economic standpoint it is essential that the work be applied promptly and thoroughly. Such patients are efficient when well. If they fall ill many besides themselves suffer, so that it is necessary for the community that they receive proper treatment. The payment made by the method I have described involves neither hardship nor humiliation. The sensibilities of the sick are not injured by the presence, the assistance, or the manipulations of students. Most people, under these circumstances, appreciate the thoroughness of the examinations and the candor of the discussions, and enjoy the break in what would otherwise be a monotonous time. It is often said that people who are able to pay a small fee for a prescription should not be used for clinical instruction, but that the latter should be restricted to paupers in the strict sense. In regard to this it must seem clear that if there is anything undesirable about such instruction it is doubly wrong to apply it to those who, from their poverty, are without protection.

In the short time between the actual opening of the hospital and out-patient department and this formal ceremony, the real dedication of the buildings has been made by the unconscious faith of a large number of patients in the wards and in the out-patient services, and by the skill, energy and devotion of a host of physicians, nurses, social service workers and medical undergraduates. With this formal dedication we may rest assured that the

future will be well and favorably influenced by the spirit of those who have shown their confidence and sympathy by their presence here today.

DEAN OPIE: We do not regard the organization of the army as established to save lives and to benefit humanity. Yet the American army has made such notable contributions to preventive medicine that it may well be questioned if it has not saved more lives than it has destroyed. It has conquered the tropics for the benefit of all mankind. Chieftain in the conquest has been General Gorgas. I have the honor to introduce General William Crawford Gorgas, Surgeon-General of the United States Army.

Sanitary Work at Panama in its Relation to the Development of Tropical Countries

BY WILLIAM CRAWFORD GORGAS

The tropics contain a much greater area of very rich arable land than does all the rest of the world. A very large proportion of this tropical arable land is contained within the valley of the Amazon, though other great rivers located within the tropics, such as the Congo and Orinoco, contain very great tracts of the best lands.

If these tropical countries were now producing foodstuffs at the same rate per acre as is now land located within the temperate zones, the food production of the world would be considerably more than doubled. These tropical lands, on the average,

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are very much richer than the agricultural lands found within the temperate zones, and if cultivated in the same manner as cultivation is now carried on in the temperate zones, would give a much larger return than the temperate zone lands at present do. In general, vegetation in the temperate zones will grow on the average not much more than half the year, and usually only one crop of corn can be produced. In the tropics, owing to the heavy rainfall and constant warmth, vegetation grows luxuriantly all the year around, and at Panama, a native farmer will generally harvest three crops of corn within the same year.

I would not call it a high estimate to say that one horsepower of labor applied to land in the valley of the Amazon would produce five times on the average as much food as one horsepower of labor applied to land in Manitoba. Taking all things into consideration, the difference in return is even greater than this, for the man in Manitoba has to use up during the winter a considerable portion of the wealth his labor has produced during the short summer, in feeding himself and stock, and in protecting both man and beast against the cold. This being the case that a horsepower of labor, applied to tropical lands, will produce manifold wealth that can be produced by the application of the same amount of labor when applied to lands in the temperate zone, one would naturally expect to find the great civilizations and great empires located within these great tropical valleys, for the measure of the degree of civilization is, on the average, the

amount of wealth that is produced by a horsepower of labor.

If in a given locality the labor of one man applied to land is able to support himself and one other person, we have a certain degree of civilization, for this amount of production allows the other man to devote himself to the arts and sciences. If one man's labor, as applied to land, will produce enough wealth to support four other men, we will have a still higher degree of civilization. If one man's labor will produce enough wealth to support eight other men, the scale of civilization reached will be still higher.

But as we look around us in the world, these conditions are exactly reversed. The great civilizations and great empires are not found in those parts of the world and in those localities where a horsepower of labor, when applied to land, will produce most wealth. On the contrary, these civilizations and these empires are now located in those regions of the globe where the least return is given to labor when applied to land. Now, why is this?

Any of us can answer without a moment's hesitation. Man does not thickly populate the valley of the Amazon and the valley of the Congo, because, as he has attempted it from time to time, he has died off from diseases incident to those regions. Though he has been able to survive these, he has done so in limited numbers and in an enfeebled state.

The most highly developed family of the human species, the Caucasian, has been the least able

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to withstand tropical disease, and therefore has not been able to develop in these tropical regions his highest civilization.

In the temperate zones, however, he has been able to thrive physically, and there his great civilizations have developed, though his labor, when applied to the land, has been able to produce much less wealth than would have been the case in the tropics.

If any discovery should come about whereby the white man could live and reproduce his species in the same condition as to health in tropical regions as he is now doing in the temperate zones of America and Europe, there is no doubt that he would eagerly seize these tropical regions, for it is a pretty absolute law of emigration and settlement that man will seek those regions in which labor, when applied to land, will give the greatest returns in wealth.

In constructing the canal at Panama, such a discovery has been made, and not only made, but demonstrated to the world. This Panama Canal is located in what has been the most unhealthy spot in the whole of the tropics. Here, within the last four hundred years, more white men have died of disease than at any other locality within the tropics. Yet at this very place, the American sanitary authorities kept ten thousand men, women and children of the Caucasian race, during the ten years of construction, in as good a state of health as if they had been at home in the temperate zone.

The white man, during the preceding four hun-

dred years, had often tried to live at Panama, but his attempts had always ended in disaster. What made the difference between the American attempt and the many previous attempts? Simply that the Americans protected their forces against the two great tropical diseases rife at Panama, yellow fever and malaria.

Between the last attempt at the introduction of whites to the Isthmus of Panama, that of the French in 1880, and ours in 1904, two great discoveries had been made in the field of tropical sanitation, i. e., that malaria is transferred from man to man by the bite of the female anopheles mosquito, and that yellow fever is transferred from man to man by the bite of the female stegomyia mosquito. With this knowledge, the American sanitary authorities on the Isthmus were able to protect the construction force at work there against diseases incident to the tropics.

Just before undertaking the construction of the Panama Canal, American sanitary authorities had had a very successful experience in banishing yellow fever and malaria from Havana, Cuba. There at Havana had first been worked out the practical methods whereby the two discoveries above referred to might be applied. For one hundred and fifty years before we started mosquito work in Havana, yellow fever had existed there. From three hundred to twelve hundred deaths had taken place there yearly. In all that time not a single month had passed in which someone had not died from yellow fever, and not a single day had passed within

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the walls of Havana without being able to find someone there sick of this disease.

On the sixteenth day of February, 1901, we commenced our anti-mosquito work. On the twenty-eighth of September, the last case of yellow fever occurred. Every year, in Havana, from three to six hundred people died from malarial fever. In the year 1900, three hundred and twenty-five deaths occurred. In 1901, the first year of mosquito work, one hundred and fifty-one deaths occurred; in the year 1902, seventy-seven deaths occurred; in 1903, fifty-one deaths occurred; in 1904, forty-four deaths; in 1905, thirty-two deaths; in 1906, twenty-six deaths; in 1907, twenty-three deaths; in 1912, four deaths, and malaria as a disease in Havana has been gotten rid of.

At Panama the same methods were applied, and with very satisfactory results. We commenced work in May, 1904. In the fall of 1905 the last case of yellow fever occurred in Panama. In 1906, when our malarial rates were highest among our employees, we admitted to our hospitals for malaria 821 out of every 1000 of our employees. This number, in 1907, was reduced to 426; in 1908, to 282, and was steadily decreased until the year 1913, when it was 76 per 1000.

The death rate among our negroes from disease, when at its maximum in 1906, was 45 per thousand; in 1913 this had been reduced to six per thousand. The death rate among our American whites in 1913 was two and one-half per thousand, and among our American women and children, 4.70 per

thousand. These figures speak for themselves, and show that our health rates were as good on the Isthmus as they were in the United States.

But I think a still better criterion of the health conditions was the appearance of the men, women and children. They had, in general, a healthy and vigorous look, such as is found in our farming classes in the northwest.

I was much disappointed that we did not get rid of malaria on the Isthmus of Panama as we did at Havana. I had fully expected to do so, and when we went to the Isthmus we put into effect the same anti-malarial measures that had been so successful at Havana. These measures were vigorously pushed for the first four years. At the end of over four years of work, May, 1908, small towns, such as Ancon, had been completely freed of malaria, as had been Havana. The malarial rate had been reduced from 821 per thousand to 282 in 1908.

In 1907 a new Commission was placed by the President in control of the Isthmus and in 1908 all power on the Isthmus was concentrated in the hands of a single man, the Chairman of the Commission. This officer thought it advisable to make radical changes in the methods of sanitation. These changes, ordered by the chairman, took execution of the anti-malarial work out of the hands of the sanitary authorities and placed it in the hands of men who had no special knowledge of anti-malarial work.

I argued against these changes as forcibly as I could, but to no avail.

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Looking back over my fifteen years of experience in tropical sanitation, I believe that if I could have continued at Panama the same methods that I had used previous to 1908, the results would have been the same as at Havana, and the canal workers would have been as entirely free from malaria as were the citizens of Havana. And I feel equally convinced that if our chairman of 1908 had been able to put into effect in 1904 the methods he forced upon me in 1908, we could not have accomplished the sanitary success at Panama which we had accomplished prior to the year 1908.

Our anti-mosquito work on the Isthmus cost us about one cent per day per capita for the total population. This is a very moderate sum, and can be afforded by any community.

The results achieved at Havana and Panama have demonstrated that each individual, at not very great expense, or large expenditure of labor, can protect himself against the tropical diseases, malaria and yellow fever. When this knowledge becomes general, the tendency will be for the white man to leave the temperate zones, which he now inhabits, and seek the rich tropical regions, where wealth will be returned to his labor in an amount four or five fold of what is now the return in temperate regions.

This will mark a great era in the history of mankind, such as was caused by the discovery of America, and it will mean that an area of fertile country has been thrown open to the use of the white man greater than that at present occupied by him.

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At the conclusion of the addresses the guests of the Medical School visited the Barnes Hospital and the St. Louis Children's Hospital.

Conferring of Honorary Degrees

AT 8 P. M. an academic procession formed in Ridgley Library, on the University campus, in the following order:

I. Officers of Administration and the Mayor of the City of St. Louis. II. Delegates. III. Guests of the University. IV. Faculties of the University.

At 8:30 P. M. academic exercises were held in Graham Memorial Chapel on the University campus.

The order of exercises follows:

- I. Processional (Marche Solennelle) . Widor
- II. Prayer . . Reverend James W. Lee, D.D.
Presiding Elder of the Methodist
Episcopal Church, South.
- III. Meditation Sturges
Mr. Charles Galloway, Organist.
- IV. Conferring of Honorary Degrees by
Acting Chancellor Frederic Aldin Hall

ACTING CHANCELLOR HALL: We have assembled to honor a group of men who have demonstrated their worthiness of special recognition. The hero of the battlefield receives his medal amidst the plaudits of his comrades; accumulated wealth and a princely house are the insignia of the financier; generations of appreciative glances attest the artist's skill. These things are as they should be. Surely then the men of science, the

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alleviator of human suffering, the director of educational movements—surely they deserve their reward. Where could this reward be more appropriately bestowed than within the calm and repose of sacred walls? At whose hands so fitly as at the hands of those who are entrusted with the duty of encouraging intellectual effort and of commending whatever makes life broader and deeper? The University counts it a privilege tonight to add to its adopted alumni men eminent in their respective fields.

By virtue of authority conferred upon me by the Corporation of Washington University, I now create Doctor of Science:

WILLIAM TOWNSEND PORTER, distinguished alumnus of the St. Louis Medical College, now a part of Washington University, and founder of its department of physiology. Chiefly responsible for the establishment of *The American Journal of Physiology*, and especially known for his contributions to the physiology of growth. A man of lofty ideals, who, as teacher, editor and investigator, reflects honor upon his early training, upon the profession which he represents and the institution which he serves.

OTTO KNUT OLOF FOLIN, one of America's happy importations from her sister country, Sweden. A man of great talent for research, who, through contributions of fundamental importance to the technique of chemistry, has brought his science into new and fruitful relations to life. The results of his work, in their bearing upon the prac-

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tice of medicine, have demonstrated anew the efficient value of the standpoint of pure science.

THEODORE CALDWELL JANEWAY, worthy son of a father illustrious in medicine. Writer of recognized ability, whose contributions have demonstrated his capacity to add to the knowledge of clinical medicine and have proved his fitness to inaugurate clinical teaching under a plan of great promise. One whose devotion to medical instruction induced him to surrender a lucrative practice in order to give his time exclusively to teaching and research. A man who has done much and to whom the profession looks for conspicuous results.

In the name of Washington University I declare that these men are entitled to the rights and privileges pertaining to their several degrees, and that their names are to be borne forever on its roll of honorary members.

By virtue of authority conferred upon me by the Corporation of Washington University, I now create Doctor of Laws:

RUDOLPH MATAS, author, surgeon. For twelve years editor of the New Orleans Medical and Surgical Journal. Writer of many monographs and treatises on surgical subjects. Known throughout the country as a practitioner of surgery. By applying experimental methods to the study of surgical conditions he devised operative methods of vital significance to the profession. A man of sound judgment, cool head and possessing a sensitive index finger of rare steadiness. One of the most eminent surgeons produced in the Southwest.

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FRANKLIN PAINE MALL, known throughout the world as an authority on embryology; an investigator, the intensive character of whose research has produced extraordinary results. To his pre-eminent position among his colleagues in this field, the Embryological Institute for the prosecution of his work bears witness. Through him experimental methods have been applied to the study of anatomy with noteworthy success. Organizer and director of the spirit of investigation among his students. One of the world's leaders in the laboratory.

SAMUEL JAMES MELTZER, another of Europe's scholars transferred to America. An active practitioner, whose methodical division of time through a series of years, enabled him to add to the fund of human knowledge on physiology. Trained as a professional teacher of philosophy, his subsequent instruction in medicine has reflected the clear thinking of an exact mind. Honored with many important posts he has brought honor to them all. In contrast with common experience, his productions multiply with advancing years and grow in value as they increase in number. A physiologist whom scholars and physicians are glad to recognize.

RUSSELL HENRY CHITTENDEN, lecturer, writer, scholar. Successful director of an important scientific school. Eminent physiological chemist, whose example in research and in teaching has stimulated a scientific spirit in his students and added many to the ranks of men proficient in the field of medicine. Associate editor of standard journals of

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physiology and biological chemistry; author of influential works on nutrition. Original investigator and able contributor to the fund of human knowledge.

WILLIAM HENRY HOWELL, author of America's authoritative text-book on physiology, to whose investigations and contributions to learned journals is added a career of brilliant teaching seldom equaled. For years President of the Physiological Association; for twelve years Dean of one of America's greatest medical schools. Keenly interested in educational problems, he brings to his writings the awakening personality of the alert instructor. One whose unclouded vision and lucid presentation insure an abiding influence upon all his associates in laboratory or lecture room. A scholar who raises the teaching profession to the plane of highest dignity. Investigator, author, teacher.

WILLIAM CRAWFORD GORGAS, a man honored the world over because through his medical knowledge and executive force the world is well-nigh made over. Through him yellow fever was banished from Havana. Through him pneumonia was controlled in the British mines of South Africa. Through him mortality in the Panama zone was so reduced as to make the canal no dream, but a reality. It is through him that Servia would now master typhus. His applied knowledge of preventive medicine is the century's chief contribution towards making a white man's civilization possible in the tropics. A servant of the human race.

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SIMON FLEXNER, Director of Laboratories of the Rockefeller Institute for Medical Research—America's most fruitful source of recent medical progress. Supremely qualified by training and experience for independent investigation. A pathologist and bacteriologist whose eminence commends international recognition. To his efforts, primarily, the mortality from meningitis has been reduced two-thirds and the lives of thousands of children have thus been saved.

WILLIAM HENRY WELCH, first member of the faculty and potent factor in the development of the Johns Hopkins Medical School. Chairman of the Executive Committee of the Carnegie Institution for Research, at Washington. Largely responsible for the inauguration of the Rockefeller Institute. Largely responsible for applying European ideals and European methods to bringing order out of chaos which characterized the study of medicine in this country until recent years. Founder of the Journal of Experimental Medicine, and for a long period its able editor. An investigator and teacher of pathology to whom the country at large is indebted for elevated standards of medical science, education and practice. The trainer of many men now prominent in medical schools from Boston to San Francisco. The center and soul of every great medical gathering. Scholar, teacher, man.

ABRAHAM JACOBI, if not ageless, yet ever youthful. A companion in exile with the lamented Carl Schurz. The fatherland's contribution to the advancement of medicine in America. A general

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practitioner of the old school, who, in the whirl of an extensive practice, keeps abreast of modern methods. A voluminous and forceful writer whose widely known honesty gives weight to his expressed opinions. Of special repute for his breadth of information and successful management of diseases peculiar to children. For many years an eminent teacher, he is still busily engaged with his private practice, lightly carrying the burden of fourscore and five years. Worthy of significant honors at the hands of institutions of learning and of citizens of every land.

GEORGE EDGAR VINCENT, administrator of wide reputation. President of a thriving university, the medical department of which, in recent years, has advanced to the front rank. Positive, aggressive, alert, whose far-reaching policies commend themselves for soundness of judgment and lucidity of form. A speaker of renown whose presence and utterances are widely in demand. Of comprehensive experience as teacher and as director of great educational enterprises; scholarly in his tastes, ambitious to serve learning by making large provision for its effective presentation. A valued addition to the ranks of the foremost college presidents of the country.

ALBERT ROSS HILL, able administrator, whose earlier experience as a teacher in a wide range of subjects keeps him in sympathetic touch with his corps of instructors. Genial, democratic, gentle while firm; a dominating influence in shaping the educational policy of a state. A man of positive

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views, of diplomatic management, of winning manner; undaunted by demands upon time or energy in the interests of educational advance, whose unsparing devotion to his work augurs well for the future strength of a rapidly developing university.

ABBOTT LAWRENCE LOWELL, the universally honored president of the universally honored institution of learning. A leader in education. Independent in judgment; deliberate yet progressive; not disregarding the past, nor fearful of modifications for the future. Wise administrator, reliable counselor whose advice is sought by boards in control of vast interests. A man among men.

In the name of Washington University I declare that these men are entitled to the rights and privileges pertaining to their several degrees, and that their names are to be borne forever on its roll of honorary members.

Before conferring the last degree of the evening a few words of explanation are necessary. In connection with the celebration of the twenty-fifth anniversary of the founding of the Missouri Botanical Garden, the Corporation voted to recognize the eminent service and distinguished scholarship of several botanists from foreign countries, in connection with the original date set for the dedication of the Medical School buildings. Owing to the situation in Europe, but one of those selected was present at the time when the degrees were to have been conferred—Professor Nathaniel Wille, of the University of Christiania, Norway. In view of the fact that but one could be here, postponement was

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made for conferring the degree upon him to the present time, since Professor Wille fully expected that he would then be here. Recent events have made that impossible, but in view of the fact of his presence at the time originally set for receiving the degree, the Corporation decided that for the second time in the history of the institution, an honorary degree would be conferred upon him in absentia.

By virtue of authority conferred upon me by the Corporation, I now create Doctor of Laws

NATHANIEL WILLE, Professor of Botany in the University of Christiania, Norway. The world's authority on certain groups of the grass-green algae. Writer of a considerable portion of Engler and Prantl's Systematic Botany, everywhere the standard. Contributor of numerous papers upon his specialty. Author of articles on taxonomic and ecological aspects of flowering plants. Investigator of the first rank, enthusiastic teacher, lecturer of wide reputation.

In the name of Washington University I declare that he is entitled to the rights and privileges pertaining to this degree, and that his name is to be borne forever on its roll of honorary members.

V. Benediction.

VI. Recessional (Fugue in G Minor) . Bach

At 9:30 P. M. there was a reception in the building of the St. Louis School of Fine Arts.



WILLIAM BEAUMONT

Portrait by Chester Harding

Exercises in Commemoration of William Beaumont

ON WEDNESDAY, April 28, 1915, at 4 P. M., exercises were held in commemoration of William Beaumont, on the occasion of the presentation of his manuscripts and letters, given by his granddaughter, Miss L. Beaumont Irwin, to Washington University Medical School. These exercises were held in the Assembly Hall of the Medical School. Acting Chancellor of Washington University, Frederic Aldin Hall, presided.

Presentation of Manuscripts and Letters of William Beaumont to the Washington University Medical School

BY JOHN FITZGERALD LEE

I am commissioned by Miss Irwin to give to Washington University, in her name, the priceless records of the labors and discoveries of her illustrious grandfather, which have been of such incalculable benefit to humanity, with his portrait by Chester Harding.

Harding ranked as one of the first portrait painters of his day in America. The merits of the portrait, as a painting, whatever they may be, will speak for themselves. The test of its value to us and to posterity will be its fidelity as a likeness to its great original. Although the artist never saw

his subject, but painted from a daguerreotype, the portrait was always considered by Dr. Beaumont's family and friends as the most faithful ever painted of him, and, because of that fact, it is very appropriate that it will preside over the room, which is to bear his name, and where his papers are to be kept forever. It is not, however, the work of the painter's hand, but the records Dr. Beaumont made, which will, for generations to come, bring troops of pilgrims here.

I shall speak of Dr. Beaumont as a physician, and of the value of his achievements, only in the most general terms, for the University has, with good judgment and good taste, appointed to speak on those subjects the distinguished surgeon who is to follow me. His devotion to his profession and sympathy with the great spirits of the past who have adorned it, make him peculiarly fitted for the duty assigned him. A few words from me, however, of Dr. Beaumont's personal qualities, even if reflected in his professional life, may not be out of place.

He sprang from an ancestry honorably established in New England since 1635. He was born in 1785. In early life he possessed only such advantages of education as came from the common schools of a country district of that time.

When he entered upon the study of medicine, he did not have the advantages of a University with its corps of learned professors, its medical library or its laboratories equipped with everything modern science can suggest. He had only the oppor-

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tunity of reading a few medical books in the office of a practitioner in a country town, and of accompanying his preceptor on his round of visits. With this preparation, he entered upon the practice of his profession. His early struggles were hard, but he met them with a courage which never flagged.

Shortly afterwards our country entered upon the war of 1812. Dr. Beaumont offered the Government his services as surgeon, and served with credit until peace was declared. Thirty-seven years of age found him with a wife and three children at a frontier post, as assistant surgeon in the army, with a salary of \$40.00 a month and four rations. Here it was that Alexis Saint Martin, whose name is so inseparably associated with Dr. Beaumont's fame, became his patient. Alexis had received a wound which tore away part of the covering of his stomach. He refused to submit to the treatment needed to close the wound, and it remained open, disclosing the operations of the stomach. Other men before Dr. Beaumont had been presented with practically similar opportunities to learn the secrets of digestion, but none of them had been prepared for the opportunity when it came, and allowed it to pass by unheeded, but Dr. Beaumont was ready when the call came to him. Then began his experiments and discoveries which Dr. Lutz will describe to you, and which have been such a boon to the world. Dr. Beaumont pursued his investigations for more than twelve years, patiently, faithfully and with a fixed purpose to get from the opportunity presented its full value. This he did

at a cost in money to himself which seems almost incredible when we consider how narrow his income was.

He was first stationed in St. Louis in 1835, and he made this city his home until his death, eighteen years later, at the age of 68. His figure was tall and slender; his presence was imposing; his head was noble and well placed; his brow was high and broad; his features straight; his eye flashing and very penetrating; his expression was that of high purpose and indomitable resolution. One well qualified to speak of him, from long acquaintance, said: "Difficulties which would have discouraged most men, he never allowed to turn him from his course. He did not attempt to evade them, but to meet and overcome them." The same authority says: "He possessed more than any man I ever knew, a knowledge almost intuitive of human character. You might have introduced to him twenty different persons in a day, all strangers to him, and he would have given you an accurate estimate of the character of each." His presence in the sick-room was gentleness itself, and his approach to the bed of pain was a benediction. He was a man of the strictest integrity, of warm and constant affections.

One of the most eminent men of medicine now living has spoken of Dr. Beaumont as the first great American physiologist, and I believe we may say that he was not only first in order of time, but that our country has produced to this day no man whose fame in his profession has been established on a

IN COMMEMORATION OF WILLIAM BEAUMONT

firmer or more enduring basis than his. He died at the height of his professional reputation, greatly beloved and honored, and was buried in Bellefontaine Cemetery.

No more fitting place for the papers which record the investigations of his professional life, which have made him famous, could be found than in the medical buildings of Washington University, and Miss Irwin asks me to say for her that it has given her very great pleasure to make this disposition of them. She hopes they will be an inspiration to many who pursue their studies here to follow in his footsteps, and devote their lives to the cause of medical science and the relief of suffering, with a determination as unalterable as his, no matter if difficulties as great as he overcame confront them.

She hopes—she believes—that the annals of the University will record the triumphs of many of its students in the never-ending battle between science and disease, who have been aided by the lessons of the life of William Beaumont.

Acceptance of the Gift by the Acting Chancellor of the University Frederic Aldin Hall

A gift is doubly blest when it enriches both the donor and the recipient. A speaking portrait of the late Dr. Beaumont is suspended upon the wall. These manuscripts and letters, these precious heirlooms of a family familiar to many St. Louisans, are now classified and arranged in an orderly manner in a room permanently assigned for their pre-

servation. Safe from the ravages of fire, secure against theft, free from danger of separation by the lure of gold, they will perpetuate the splendid work of their author and will insure the generous donor's name for many, many years. Thus she who presents the gift is the richer for her beneficence.

These monuments of intelligent industry will henceforth be available in the original for the inspiration of all who are entitled to their use. They will be visible to thousands of interested spectators. Occasionally, at least, they will kindle aspirations in future physicians and scholars. This room, with its additions of significant manuscripts, will more and more be the resort of those of inquiring mind.

The Medical School, through this gift, adds one more treasure to its intellectual resources and thereby increases its worth to the community. The recipient also, then, is made the richer and the gift is doubly blessed.

In accepting this gift in behalf of Washington University, I assure you, and through you, Miss Irwin, that the University authorities are fully cognizant of its intrinsic value to the profession; that they acknowledge the unselfish motive which prompts the act of generosity, and that they accept it with grateful appreciation.

The University will endeavor to fulfil every wish accompanying its presentation, and will seek to make that wise use of its advantages which such a collection merits. May it remain for generations of medical students and professors to see, to inspect, to study.

William Beaumont as a Practitioner

BY DR. FRANK JOSEPH LUTZ, CLINICAL PROFESSOR
OF SURGERY, WASHINGTON UNIVERSITY

Two generations have passed away since Dr. William Beaumont responded to his last call, April 25, 1853, and his birth was recorded more than a century and a quarter ago. We are, therefore, sufficiently removed from him not to bestow fulsome eulogy when estimating his position among the practitioners of his day, nor are we likely to indulge in unreasonable and harsh criticism of the personal traits and characteristics which made him a conspicuous figure. His fame as a scientist and investigator rests upon his experiments concerning the gastric functions—but this fact must always stand out prominently in an appreciation of Beaumont: He was essentially a practitioner of medicine. He qualified himself for his profession as was then the custom, by an apprenticeship of two years to Dr. Benjamin Chandler, of St. Albans, Vermont, whose office and home he entered to read and practice medicine. He brought to his task a common school education, obtained under difficulties, a good memory, accurate power of observation, an unusual habit of logical thought and the power of correctly recording observations, an accomplishment which is attested by his notebooks, his journals and the records of his cases.

Armed with a flattering certificate of proficiency from his preceptor, and a license from the "Third Medical Society of the State of Vermont, author-

ized by law to grant a license to practice medicine," which was granted him in January, 1812, he started upon his career.

He entered the Army of the United States on the thirteenth day of September, 1812, on the strength of his credentials (as a Surgeon's Mate), and soon afterwards began private practice in Plattsburgh, New York. During his service in the Army, he furnished accurate descriptions of his trips, of the marches in which he participated, and of the engagements in which he and the Army to which he was assigned took part. He also made a painstaking record of the diseases prevalent in the Army and their treatment. During this first enlistment, an unusual opportunity for acquiring surgical experience was furnished by the explosion of a magazine, and in August, 1814, he took an active part in the Battle of Plattsburgh.

After the Treaty of Ghent had been signed, Beaumont retained his position in the Army on his merits. In 1815, following a quarrel with a fellow officer, which was to have terminated in a duel, but which did not proceed beyond a war of words, strong and expressive it is true, he resigned from the Army again to enter private practice in Plattsburgh, New York, and to take up with Dr. Senter commercial pursuits, by opening a store containing "a general assortment of drugs, medicines, groceries, dye woods, etc., of the first and best selection," which the firm advertised that "they calculate to sell on liberal terms for cash or approved credit," to say nothing of the notifica-

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tion that medicines, etc., would be put up with accuracy and care.

He first associated himself with the organized medical profession in 1818, when he joined the Clinton County Medical Society, affiliated with the New York State Society. A unique provision of the rules governing this County Society was the imposition of a fine for non-attendance upon the meetings. About this time he assumed social obligations by taking unto himself a wife, the daughter of "Friend Israel Green, innholder in Plattsburgh." Jesse S. Myer, his biographer, tells us that though happy in the midst of his professional and social ties, he was discontented and the call of the Army rang in his ears. When his friend, Joseph Lovell, was chosen surgeon-general of the re-organized army, he offered Beaumont a clerkship at a salary of \$1,000.00, which was refused. Shortly afterwards, Beaumont was commissioned by President Monroe post surgeon in the Army, and ordered to Fort Mackinac, where he reported for duty in June, 1820, and took medical charge of the garrison. Permission was granted him by the surgeon-general to accept private patients, as had been the case in Plattsburgh, and as he subsequently was allowed to do at Green Bay, Wisconsin, and St. Louis, Missouri. His professional work at Mackinac consisted in looking after the garrison and the employees of the American Fur Company, and such other residents as demanded his services; in making a monthly report as to the condition of the patients in the hospital, the hospital supplies, and the re-

ording of weather observations. Besides this, he collected botanical and geological specimens. He shrewdly combined great solicitude for the comfort of his patients and the study of botany by insisting successfully that the public gardens of the garrison, which the war department intended to convert into a vegetable garden, should be put to no such base use, but should be enjoyed by his patients.

The accuracy and completeness of the records of the cases under his care shows that he had by this time become a most careful observer, a splendid diagnostician, and an unusually successful practitioner. The most interesting case which he recorded, and upon which his fame as a physiologist rests, is that of a French Canadian voyageur, nineteen years old, whose chest and abdomen were injured on the left side by the accidental discharge of a gun, the injury resulting in opening the pleural cavity, parts of its bony wall being torn away, and a portion of the lung prolapsing. There was an injury to his abdominal wall and to the stomach itself. Under his skilful care, the patient recovered from these extensive injuries, leaving however a fistulous opening which led into the stomach. The report of this case, which was made to the surgeon-general, was printed in the Medical Recorder of Philadelphia in 1825. The fistulous track was utilized by Beaumont for the study of the process of digestion, of the gastric juice and of the movements of the stomach. The case was subsequently published in book form in Plattsburgh, New York, in 1833, after he had interested many physiologists

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and many practitioners of medicine in his observations which he continued to make upon Alexis St. Martin—this was the name of his patient—under great difficulties, many years after he had given the results of his experiments to the world.

He published the observations which he made at Prairie du Chien concerning an intermittent fever as it prevailed in that town during 1830. It contains so complete a description of the fevers prevalent in the camps of soldiers, and interpreted so accurately their causes as to be almost modern. It goes without saying that the publication of Beaumont's book made him conspicuous in the social world as well as among his professional brethren, and when he visited Washington he enjoyed being lionized as a great author and distinguished practitioner by the residents of the capital, and at the same time he began to lay the foundation for the claims which he subsequently urged upon the general government for reimbursement of the expenses incurred in making the experiments on Alexis St. Martin, on the ground that they were for the benefit of humanity and science, and our knowledge concerning the stomach and digestion was thereby greatly increased; but as in our day, the legislative ear is not easily made to hear the voice of science, and Beaumont still awaits the substantial recognition of his country. Nor did Beaumont neglect the opportunities which the possession of so rare a case afforded, but presented it to various medical societies in different cities of the East.

He also showed his practical trend by suggesting various improvements and regulations for commercial hospitals, which were nearly modern in their exposition.

In 1834 Beaumont was ordered to report at Jefferson Barracks, a military post situated about fourteen miles south of St. Louis, and in the following year he was transferred to the Arsenal, located in the southern part of our city, where he performed the duties of a medical officer and those of a medical purveyor of the western district, and as at his other stations, he secured for himself the privilege of doing civil practice.

When Beaumont set up his household gods in St. Louis, he brought mature age and ripe experience, considerable reputation acquired in the Army and by the publication of his book. His lines fell in pleasant places. The greater part of society was composed of the military and their families, and being one of them he soon occupied the foremost rank among the practitioners of St. Louis. He modestly admits in one of his letters: "I have a very handsome, lucrative and respectable private practice, a reputation far above my deserts, and a professional popularity more than commensurate with my best practical skill or abilities."

Beaumont was a man of great determination. He was restless under restraint and opinionated to a degree which often brought him in conflict, whilst in the Army, with his superior officers, and at least during his sojourn in St. Louis, with his professional brethren.

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As stated a moment ago, he joined the organized profession in 1818 in New York State, and soon after he took up his residence in St. Louis he joined the St. Louis Medical Society and continued his membership until March, 1843, when he resigned. The records show that he was an active participant in the quarrels and stormy sittings which then characterized the scientific sessions. The distinction of Vice-President of the Society, conferred upon him in 1848, was short-lived, for he resigned for some unexplained reason. In the following year his conduct for advertising his professional accomplishments in the columns of the Republican—a daily newspaper—was made the subject of criticism on the part of some of the members and of inquiry by the Society, but he so successfully defended himself and explained that it had been thoughtlessly done, that the Society voted that the advertisement be discontinued, with which request he promptly complied. His inaugural address as president, in 1840, consisted in an attempt to show how the Medical Society had failed to accomplish the purposes for which it had been organized, and of course pointed out how the needed reforms could be brought about. He was unsuccessful, however, as a reformer, and succeeded only in keeping the members away from the meetings. He seems not to have been a peaceful character so far as his professional relations are concerned. His several attempts to associate with himself other practitioners were all of short duration.

Notwithstanding the high esteem in which

Beaumont was held by the community, as well as by his professional brethren, or perhaps, I should say, because of the eminent position which he occupied, he was not spared the annoyance, chagrin and unenviable notoriety which follow in the wake of a malpractice suit. The case in which Beaumont was involved became a "cause célèbre" in local history, commonly known as the "Mary Dugan" case.

It appears from the record that Mary Dugan, a poor, unfortunate woman, fifty-five years of age, was afflicted with an enlargement in the right inguinal region, with tension and distension of the abdomen—the swelling fluctuated; a puncture was made by Doctor Adreon, the co-defendant of Beaumont, a quantity of "well digested pus was discharged" and "some fetid gas emitted." In the evening some intestinal contents passed through the openings in the groin, together with thin sanies and fetid gas. In a few days "the abscess degenerated into a foul, ill-conditioned ulcer" and "sloughing of soft parts from the groin took place." Doctor Beaumont was called in consultation, and with scissors cut off the mortified portions of skin and cellular tissue. The patient so far recovered that her physician, Doctor Adreon, advised a trip into the country, where she remained for four years, the fistulous opening sometimes closed, then again discharging.

After the lapse of four years she returned to St. Louis and brought an action against Doctors S. W. Adreon and William Beaumont to recover dam-

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ages in the sum of ten thousand dollars for an injury which she alleged she had sustained, occasioned by a surgical operation performed by the defendants in April, 1840. The declaration averred that the plaintiff was afflicted with a hernia and that the defendants cut into the abdomen and also cut one of the intestines. The witnesses for the defendants testified that there was no hernia, but that the disease was typhlo-enteritis. The trial of the case occupied the court nearly a week, a score of physicians, preachers and women being examined in behalf of both plaintiff and defendants, and the jury returned a verdict for the defendants.

The finding of the jury did not, however, close the case. The physician into whose hands the patient had fallen, the principals of the suit, as well as many of the medical witnesses, editors and attorneys became involved in a war of pamphlets which extended over many months; and whilst the reader who pursues these literary productions after the lapse of more than half a century is unable to decide whether Mary had a hernia or suffered from typhlo-enteritis, he cannot but be profoundly impressed with the vigorous style of the pamphleteers, and the persistency with which the participants defended their views. Their literary effusions make the letters on professional conduct addressed by John Bell, of Edinburgh, to James Gregory, sound like the cooing of a dove. Then, as now, the brethren did not always "dwell together in unity."

In 1836 St. Louis University, at the instigation of the St. Louis Medical Society of Missouri,

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organized a Medical Department, appointed trustees and selected a faculty. To Beaumont the chair of surgery was offered. After correspondence with the head of the Army Medical Department he accepted the professorship conditionally, but the plans of the University did not materialize until 1842, and the records do not show that he ever delivered lectures.

In his practice he seems to have been painstaking, accurate in his observations, sympathetic, and withal the best type of a general practitioner. He was determined of purpose and possessed of great firmness. He met the greatest difficulties and sought to overcome them without flinching. He was a man of rare judgment and most judicious in the selection of the means of accomplishing his ends. He was patient and kind, benevolent and considerate, a most modest man, by no means self-asserting, and rather reticent. Of course, he was easily the first surgeon in St. Louis during his day, and without having had the advantages of what was considered almost a necessity, namely, a European medical education, or, for that matter, without having enjoyed the advantages of any collegiate education, literary or professional, he nevertheless attained the foremost rank as a practitioner. Although direct in his purposes, without much circumlocution, and free of pretention and deception, he nevertheless learned that it was not necessary to administer potions nauseating and large. My friend, Mr. Thomas K. Skinker, who honors us with his presence, in his early life enjoyed the

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privileges of Beaumont's ministrations as a physician, and he testifies that noxious doses of calomel and castor-oil might be concealed in blackberry preserves.

Beaumont lived in an age when philosophic speculation was rife, hence we find that his reading embraced the poets, the philosophers, and the speculators concerning our moral nature. He became enamored of Franklin's "project of attaining moral perfection," and conceived the idea of living without committing any fault at any time and to conquer all faults that either natural inclination or custom might lead him into. He constructed a plan or scheme of the virtues he intended to acquire by habit, one at a time, until he had acquired all of the thirteen which it was his ambition to be possessed of primarily. Others were to be added.

Besides his many accomplishments and virtues as a practitioner of medicine, his beautiful home life stands out pre-eminently. He enjoyed to the fullest extent the peace and quiet of family relations to the very end of his useful and honorable career as a practitioner.

His name has shed lustre upon our city. He recognized and embraced a great opportunity.

William Beaumont as an Investigator

BY JOSEPH ERLANGER, PROFESSOR OF PHYSIOLOGY,
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William Beaumont, you have heard, was an eminent and respected practitioner of St. Louis; as an investigator his fame is limited only by the

bounds of civilization. Known to most of us through the primers from which we learned our first lessons in physiology, merely as a United States Army Surgeon who observed the motions of the stomach of a Canadian trapper through an opening made by a shotgun wound, only those of us who have had the opportunity to learn more about him from other sources can have any true conception of the character of Beaumont's work and of the high regard in which it is held by physiologists the world over.

It might be well, therefore, by way of introduction, to briefly summarize the nature of his investigations. In 1822, at the age of 37, while in the service of the United States Army as surgeon at the post of Mackinac, he was called upon to care for young Alexis St. Martin, who had been dangerously wounded by the accidental discharge of a shot gun. Although the case was a desperate one, the patient eventually made a complete recovery, excepting that there remained a permanent opening through the abdominal wall into the stomach, despite the best efforts of his physicians to prevent the latter result. In the course of time a valve-like flap developed over the opening. While this flap served to more or less effectually retain the food within the stomach, it was still possible, by pushing it aside, to observe what was going on within the stomach, and to insert materials into and to remove them from the stomach. The convalescence of the patient occupied something over two years. Only in 1825, however, that is, about

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three years after the accident, did it begin to dawn upon Beaumont that he had in this case an unusual chance to discover something new by observing the process of digestion through the opening into the stomach. At this time he writes: "This case affords an excellent opportunity for experimenting upon the gastric fluids and the process of digestion. It would give no pain nor cause the least uneasiness to extract a gill of fluid every two or three days, for it frequently flows out spontaneously in considerable quantities. Various kinds of digestive substances might be introduced into the stomach, and then easily examined during the whole process of digestion. I may, therefore, be able hereafter to give some interesting experiments on these subjects." From this date, 1825, and until 1833, frequently interrupted, however, often for a year or more at a time, by an unreasonable unwillingness of St. Martin to serve as subject, Beaumont devised and carried out the experiments, 238 in all, that form the basis of his book entitled "Experiments and Observations on the Gastric Juice and the Physiology of Digestion," published at Plattsburgh in 1833. It should be added that the first series of observations, limited to four experiments by one of the many sudden and unexpected departures of St. Martin for his home in Canada, was reported in the Medical Recorder of Philadelphia in 1826.

This work immediately attracted the attention of the scientific world. The very next year after the appearance of the book, it was translated into

German under the title "New Experiments and Observations on the Gastric Juice and the Physiology of Digestion, Conducted in a Most Remarkable Manner in the Course of Seven Years, Upon One and the Same Subject," and in 1838 an edition was issued in Scotland by Doctor Andrew Combe. Furthermore, extensive reviews of the experiments quickly appeared in the scientific journals, and after an unusually brief delay for this era, the new additions to the knowledge of digestion were incorporated in the handbooks and textbooks of physiology and medicine. Expressions of appreciation of his achievement came to Beaumont in the form of congratulatory letters, of election to honorary membership in medical societies, of invitations from scientific bodies, both local and foreign, to demonstrate his interesting case, and of the conferring upon him of the honorary degree of Doctor of Medicine by the Columbian College of Washington.

In order to convey a more concrete idea of the high regard in which Beaumont's results were held by contemporaneous writers, I quote the following from Combe's "Physiology of Digestion," published in 1836, that is, three years after the appearance of Beaumont's work: "* * * From the excellent judgment with which he carried on his investigations, and the scrupulous care with which he announces his results and separates fact from theory, it is impossible not to place great confidence both in his personal qualifications as an observer and in the general accuracy of his statements * * *. In treating of the properties of

the gastric juice, I shall, on all disputed points, give a decided preference to the observations of Doctor Beaumont over those of any other physiologist."

The true test of the value of any contribution to science, however, is time. As is well known, there are innumerable instances where results, immediately hailed throughout the world as remarkable discoveries, are found, with time, to have been greatly over-estimated. When, therefore, after a lapse of seventy years, an authority (Osler) characterizes Beaumont as "the pioneer physiologist of this country, the first to make an important and enduring contribution to this science," we may rest assured that Beaumont's contemporaries did not misjudge the quality of his work.

It may be of interest then to attempt to determine, by analysis, the qualifications, personal characteristics and the conditions that account for Beaumont's achievements as an investigator. Of scientific training, Beaumont, so far as is known, had none. Attendance upon the common schools of Connecticut and two years of apprenticeship under a practitioner in St. Albans, Vermont, represent the only didactic training of which there is any record. If, therefore, he had any knowledge of physics, chemistry, microscopy, or medicine as a science, it could have been derived only through reading, not through actual practice.

I have gained the impression that Beaumont himself felt that the limitations imposed by his lack of training in these directions prevented his making the most of his interesting case. I greatly

doubt, however, whether familiarity with these sciences, as then known, would have been of any great assistance to him. This conclusion is forced upon me by the fact that his attempts to make up for his imagined inferiority by securing from investigators who were regarded as leaders in their specialties, suggestions in the way of new experiments, or data based upon a personal examination of materials obtained from St. Martin, in only rare instances bore fruit, and then the information gained usually lacked conclusiveness. For instance, Beaumont was unable to make the chemical tests necessary to determine the nature of the acid which the sense of taste demonstrated to be present in the gastric juice. Desirous that the excellent opportunity for determining the nature of this acid offered by his unusual case should not be lost, specimens of the juice were sent to Professor Dunglison at the University of Virginia and to Professor Emmet at Yale University. Both reported the presence of hydrochloric acid. The results of their analyses were not, however, convincing enough to physiologists to justify their unqualified acceptance; indeed, twenty years elapsed before conclusive proof of the presence of free hydrochloric acid in the gastric juice was furnished. Beaumont also sent a specimen of gastric juice to Professor Berzelius of Stockholm, the chemist "of all others best qualified to investigate the subject of such deep interest to mankind." But Berzelius, in the absence of sufficient data, felt he could not undertake the analysis with any hope of success.

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Furthermore, when, after his experiments were well under way, Beaumont took his subject, St. Martin, with him to the medical centers of the Atlantic seaboard in search of scientific assistance, the suggestions he received in only rare instances bore fruit. It is even questionable, it seems to me, whether the contemplated trip with St. Martin to Paris, then probably the greatest medical center of the world, a visit rendered futile through the shortness of the furlough granted for that purpose, would have been any more fruitful of helpful suggestions.

This is not surprising when it is realized that at this time physiology, as a science, had just begun to stand by itself. There was, in this country, not a single laboratory of physiology, properly so-called, and there were only one or two abroad. Progress then depended more upon the efforts of the individual than upon the facilities or the traditions of any particular laboratory.

Forced by his early isolation with his subject to adapt his work to his crude surroundings, only the simplest and most direct methods of experimentation were available. An ordinary house thermometer, some vials, a sand bath for maintaining these vials at the body temperature—though occasionally the arm pits served the purposes of an incubator often for hours at a time—and a hand lens constituted his only apparatus. The stem and bulb of the thermometer, removed from the supporting scale, served as an indicator both of the motions of the stomach and of its temperature.

The temperature was determined by marking the height of the mercury on the stem while the bulb was in the stomach and then making the reading by replacing the stem on its scale. It is not without interest to add that a careful perusal of Beaumont's manuscripts and of his book fails to show that his visits to the medical centers of the Atlantic seaboard resulted in alterations in or additions to the simple apparatus employed in the very first series of experiments.

Indeed, I cannot help but feel that his lack of training and his early isolation with his subject, St. Martin, at the frontier posts, Fort Mackinac, Fort Niagara and Fort Crawford, and at Burlington and Plattsburgh, account in some measure for his achievement. Pioneer work, such as he was concerned with, requires only crude instruments and facilities; essentials can often be detected best by mere observation and by the simplest of instruments. At such a stage in the development of a subject the more refined methods of physics, chemistry and microscopy are as apt to distract attention from the main problems as to lead to their solution.

Beaumont's isolation in frontier army posts gave him another advantage regarded by investigators so necessary to thoughtful work, namely, leisure. The term leisure, as here used, is not synonymous with idleness, but is intended to denote "freedom for thought and study and research." Time for contemplation of one's results, time to arrive at new ideas suggested by

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them are obviously essential to creative work. Beaumont himself realized the advantages of leisure, or better perhaps the disadvantages of distractions. Assigned to duty in New York at his own request because of a desire to avail himself of the supposed scientific advantages of that center, it was not long before he wrote as follows: "I have been unable to do much at concrete experiments and observation since I came here, so numerous and increasing are the calls of the curious, the social, the scientific and the professional * * *. It is an unfavorable place for the pursuit of physiological inquiries and experiments."

If Beaumont possessed neither scientific training nor good facilities for work, is it possible that after all he did little more than anyone else would have done under the same circumstances; that, as has been maintained by some, he merely availed himself of an unusual opportunity that chanced to cross his path? To be sure it cannot be denied that the observations and experiments could not have been made without the patient, but does not practically every physician in the course of an extended practice meet with cases offering opportunities quite as unusual for making close and painstaking studies of new and unsolved conditions? Yet in this country Beaumont, by work done as late as 1833, is the pioneer in the field of physiology. But to confine ourselves in this connection to Beaumont's specific field, quite a number of cases of gastric fistula in man, similar in many ways to Beaumont's, were described prior

to 1825, some of them indeed by eminent practitioners in the leading clinics of Europe. We ask with Reyburn, "To what important scientific uses were these cases applied? * * * What fact observed in them has been referred to by physiologists to decide the nature and laws of animal function?" So insignificant relatively were the results of such observations that they have been unearthed only through antiquarian research. Beaumont's success as an investigator obviously is not attributable to opportunity only. It is, to quote, the success that "can only come when the man and the opportunity meet—and match" (Osler).

It may be of interest to add that since Beaumont's demonstration of the scientific value of carefully conducted experiments on cases of gastric fistula, opportunities to utilize suitable cases in an effort to add to our store of physiological and clinical knowledge have not been so often neglected as in the past.

One does not have to search long in Beaumont's letters, as given in the "Life and Letters of Beaumont," by our lamented Jesse Myer, or in his book, to discover the traits of character that account for his achievement. They are a logical and methodical mind and a "desire to know" coupled with the willingness to make the sacrifices of time and even of money necessary to satisfy that desire.

The spirit of inquiry is evidenced everywhere in his writings. An excellent indirect expression

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of it is contained in the letter quoted from above, written when Beaumont first awoke to a realization of his opportunities; while in the preface of his book Beaumont specifically states that the experiments were "made in a true spirit of inquiry, suggested by the very extraordinary case which gave me an opportunity of making them."

Nor is it to be supposed that the appearance of his book satisfied his "desire to know." On the contrary, his letters reveal constant efforts on his part to continue the observations that were terminated in 1833 by the departure of St. Martin, a departure ostensibly temporary but actually final. The state of mind created by St. Martin's refusal to return is well indicated in the last of the repeated efforts Beaumont made to induce him to submit to another series of observations. In a letter written from St. Louis in 1852, when, at the age of 68, Beaumont says: "I * * * fear that the strong and increasing impulse of conscious conviction of the great benefits and important usefulness of a further and more accurate physiological investigation of the subject will compel me to still further efforts and sacrifices to obtain him (St. Martin). * * * I must have him at all hazards and obtain the necessary assistance to my individual and private efforts, or transfer him to some competent scientific institution for thorough investigation. * * * I must retrieve my * * * remissness of a quarter of a century or more by double diligence, intense study and untiring application of soul and body to the subject before I

die * * *." This letter gives concrete expression not alone to the desire, which was constantly with him, to continue his interrupted observations, but also to his willingness to furnish the most important requisites to success in investigation, namely, "diligence," "intense study" and "untiring application." That he thus applied himself early in his career is evidenced by the number of experiments he performed in the course of the twenty-five months during which he was able to prosecute his observations on St. Martin.

If any other evidence is needed of Beaumont's devotion to knowledge for its own sake than the fruit of his painstaking endeavors as recorded in his book, it may be found in the monetary sacrifices he made in order that he might pursue his investigations. At a time in his career when he could least afford it, Beaumont defrayed all of the expenses necessary to carry on his studies. Not alone did he presumably supply his own simple apparatus, but in addition he furnished board and lodging for St. Martin, and occasionally for his family, too, and paid St. Martin a not inconsiderable allowance. It was only during the very last series of experiments that Beaumont was, in part, relieved of the heavy burden that the care of St. Martin, who was constantly making demands beyond the terms of the contract, imposed upon him.

The necessity that Beaumont was under of supporting St. Martin is one of the evidences of the failure of the War Department and also of

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Congress to realize at this period of our history the value, not alone to science but also in the long run to the quality and morale of the medical service of the Army, of making it at least convenient for surgeons with special aptitudes or opportunities to apply themselves in the direction of their greatest interests. Beaumont all too frequently found it necessary to sacrifice time and energy merely in an effort to secure conditions essential for the conduct of his observations.

This attitude of the Government was very largely redeemed, however, through the efforts of two individuals, whose names appear prominently in Beaumont's correspondence: Joseph Lovell, Surgeon-General of the United States Army, and Edward Everett, then representative of Massachusetts in Congress.

Through the kindly and sympathetic efforts of Lovell, Beaumont was granted many favors. He placed at Beaumont's disposal all of the facilities of the Surgeon-General's library, conferred with him frequently in regard to the conduct of his experiments, assigned him, whenever possible, to posts where it was believed better facilities were available, and was responsible for appointing St. Martin Sergeant in the United States Army so that he might be attached to Beaumont as an orderly during the last series of experiments conducted in Washington.

As has been said, another attribute that helps to account for Beaumont's successful utilization of his opportunity was his logical mind. He re-

alized the necessity of so conducting his experiments with the aid of controls as to leave no room for doubting the conclusions. We may illustrate this by means of an experiment selected for the reason that at one and the same time it typifies his usual logical method and leads to one of his most important inferences. "At nine o'clock A. M. I took 40 grains masticated, boiled beefsteak, divided into two equal parts—put one into 4 drams gastric juice, and the other into 4 drams of a mixture of muriatic and acetic acids, reduced with water to the flavor of the gastric juice * * *. Placed them together on the (warm) bath. At 6 o'clock P. M. the meat in the gastric juice was all dissolved; that in the diluted acids * * * left a residuum of a jelly-like consistence * * *." Commenting on this experiment he says, "This was an attempt to imitate the gastric juice. It was not satisfactory. Probably the gastric juice contains some principles inappreciable to the senses, or to chemical tests, besides the acid and alkaline substances already discovered in it." Three years later, undoubtedly stimulated by Beaumont's difficulties, the riddle was solved by Johannes Müller, Professor of Physiology in the University of Berlin, and his assistant, Theodore Schwann, by the discovery in the gastric juice of the principle to which the logic of Beaumont had pointed, namely, the digestive ferment pepsin.

Another essential to intelligent investigation, one that even men who have every facility in the way of training and of libraries are apt to neglect,

is an acquaintance with what is already known of the subject of one's inquiry. In that way alone is it possible to avoid needless repetition and to plan intelligently on the basis of past experience. That Beaumont familiarized himself with the more important literature on the subject of digestion is perfectly obvious on every page of his book, while his manuscripts reveal how carefully and systematically his reading was done. One of the most interesting of the papers of his collection is his "Synoptical Index of Different Authors on Digestion, Stomach, Gastric Juice, Digestion, Remarks, etc." Under this heading one finds, neatly arranged, a list of the works consulted by him together with the pages upon which statements of interest to him are to be found.

Thus far mention has been made only of the position Beaumont holds in the rank of investigators and of the qualities that made that position attainable. His fame, however, does not rest only upon his logic, nor upon his industry, nor upon his ability to avail himself of an opportunity, but mainly upon the facts contributed by him to physiology and the inferences we are in position to draw from them. Therefore, to fail to enumerate, on an occasion of this kind, at least the more important of the facts brought to light by his investigations, might be regarded as a slight to their value.

There are many ways in which the facts might be considered. We might, for instance, compare the status of the physiology of digestion as it was left by Beaumont with the status in which he found

it. This method, however, has been commonly employed in the earlier reviews of Beaumont's book, and to make the comparison satisfactorily would require more time than we have at our disposal. Or, we might, in very general terms, direct attention to the more significant of his contributions. Such a treatment of the subject might prove interesting, but since it is the method that has been employed in practically all of the biographical sketches of Beaumont, there seems to be no reason for another attempt of the same kind now. Or again, we might merely enumerate the facts and inferences listed in the conclusion of Beaumont's book.

I propose, however, to follow a somewhat different plan, and that is to take stock, so to speak, of the present value of Beaumont's facts and inferences. Reviews of this kind were frequent when his book first appeared, but aside from scattered references to isolated facts mentioned in reviews of the literature accompanying some specific investigation, no attempt has been made in the last seventy years to systematically search in Beaumont's work not alone for facts which he has emphasized, but also for facts which, through the progress made by physiology since his work was done, have assumed new and important significance, a significance that could not have been realized by Beaumont. A resetting of the facts in the edifice of science seems, therefore, to be needed and certainly is timely. That time would necessitate such a resetting, Beaumont himself evidently

IN COMMEMORATION OF WILLIAM BEAUMONT

believed, for he says: "My opinions may be added to, denied or approved, according as they conflict or agree with the opinion of each individual who may read them; but their worth will be best determined by the foundation on which they rest—the incontrovertible facts."

I have, therefore, made a list of facts, not of all of them, but only of a few of those that seem, in the light of modern physiology, to be the most significant, and have in certain instances added comments for the purpose of making clear their relation to the physiology of digestion as a whole. At the risk of tediousness, I propose to enumerate these facts:

1. Beaumont proved that the juices of the stomach are formed by the walls of the stomach, by actually watching, with the aid of a hand lens, the collection of the juice at the gland orifices in the mucous membrane.

2. He showed that this juice is formed through contact of food materials with the wall of the stomach; that foreign bodies, not foods, do not supply an adequate stimulus for the secretion of the gastric juice.

3. That the small amounts of fluid contained in the stomach empty of food, represent swallowed saliva and the mucus which is formed on the surface of the mucous membrane for the purpose of protecting it, and which is not to be regarded as digestive juice.

4. He settled the moot question as to whether or not the gastric juice is acid in reaction, by

showing, by the sense of taste, that the acid juice is formed only when food is taken into the stomach, while the slight secretion found in the stomach at other times is not acid in reaction, and indeed, as has been said, is not gastric juice at all (thus confirming Tiedemann and Sinclair (Myer, p. 181-2)).

5. He was able, through the analyses of Dunglison and Emmet, of specimens of gastric juice obtained from his case, to convince himself again by the sense of taste, that Prout was correct in maintaining that the main acidity of the gastric juice is due to hydrochloric acid.

6. He settled conclusively the question as to the nature of gastric digestion in man by proving it to be purely a chemical, rather than a mechanical or so-called vital process.

7. He obtained presumptive evidence of the existence in the gastric juice of another digestive principle beside the acid.

8. He seemed to feel that there is a definite relation between the quantity of gastric juice formed and the amount of food ingested.

9. He made extended observations on the time required for the completion of the gastric digestion of different diets.

10. He noted that fluids pass from the stomach very soon after they are ingested.

11. He noted that oils and fats retard the emptying of the stomach.

12. He observed that starches pass from the stomach more rapidly than any other foods.

13. He noted that certain foods that are not

IN COMMEMORATION OF WILLIAM BEAUMONT

acted upon by the gastric juice, raw cabbage for instance, may very quickly be passed on into the intestines while at the same time digestible materials may be retained in the stomach.

14. He showed that bone dissolves in the gastric juice, provided a sufficient quantity of juice is supplied.

15. He observed that the emptying of the stomach into the intestine begins very early in the process of digestion, but that it is accelerated toward the close of digestion.

16. It may be inferred that he regarded the acid of the gastric juice as one of the factors determining the emptying of the stomach; for he says: "That toward the latter stages of chymification, it (the chyme) becomes more acid and stimulating, and passes more rapidly from the stomach."

17. He frequently finds bile (which we now know is usually accompanied by pancreatic juice) in the stomach some time after it has been empty of food.

18. He finds bile in the stomach after the ingestion of a meal rich in fats.

19. And he shows that fats are digested better by bile-tinged gastric juice than by colorless gastric juice, while the gastric digestion of other than oily food is retarded by the admixture of bile.

20. He states clearly that bile is called into the stomach only for the chymification (emulsification) and solution of oil by the gastric juice.

21. He shows that the addition of bile-stained

juice to the digested contents of the stomach causes a precipitate to be formed.

22. There are reasons for believing that he noted an interruption (inhibition?) of gastric movement by the act of swallowing; and that the stomach contracts down on its contents (latter also observed by Magendie).

23. By the use of the stem of a thermometer he followed the gastric movements probably incited by irritation of the pyloric region of the stomach.

24. He noted toward the end of digestion, contractions of the pyloric region that recurred more or less rhythmically every two or three minutes.

25. He confirmed Magendie in showing that when the stomach is empty, noises caused by the motion of the air in it almost always occur, thus laying the foundation for the recent conclusive demonstration of hunger contractions of the stomach.

26. He showed that in man the sense of hunger subsides immediately when food is directly introduced into the empty stomach, and concluded that the sense of hunger resides in the stomach.

27. He showed that anger and impatience interrupt the progress of digestion.

28. He found that no gastric juice is secreted during fever.

29. And finally, he noted that the temperature of the pyloric region of the stomach usually is above that of the fundic region, an observation that

IN COMMEMORATION OF WILLIAM BEAUMONT

is now accounted for by the proximity of the liver to the former.

My brief remarks and the list I have given of Beaumont's important facts, can convey only a very inadequate conception of what Beaumont actually succeeded in accomplishing. Only by reading his book and by examining his manuscripts and letters, which today have generously been given into the custody of the University, can the real man be disclosed. The placing of this invaluable collection where it can be seen by all who may be interested, should, therefore, have the effect of keeping before us the aims, the methods and the accomplishments of a model investigator; of an investigator who worked without any other incentive than "an honest desire to contribute a mite to Medical Science." It will, however, have still another effect. "In our busy lives," to quote from Vaughn, "* * * we too seldom think of those whose labors have placed certain departments of medicine among the exact sciences. The healing art had its origin in the priestly superstitions of primitive man. From what it then was to what it now is, medicine has been advanced by the patient labor and persistent toil of many men, who have devoted their lives (themselves) to searching for the truth."

This collection of manuscripts and letters will ever serve to remind us that the new world first became a prominent party to this progress with William Beaumont.

WASHINGTON UNIVERSITY MEDICAL SCHOOL

At the conclusion of the addresses the manuscripts and letters of William Beaumont were inspected by the guests of the Medical School.

Special Lectures in Association with the Dedication Ceremonies

A LECTURE on Infective Diseases and Their Control, by Dr. Simon Flexner, Director of the Rockefeller Institute for Medical Research, was given under the auspices of the Washington University Association in the Assembly Hall of the Medical School, on Wednesday, April 28, at 8 P. M.

Lectures by Otto Knut Olof Folin, Professor of Biological Chemistry, Harvard University, were given in the Assembly Hall, as follows:

MONDAY, APRIL 26, AT 4 P. M.—The Utilization of Food Protein.

TUESDAY, APRIL 27, AT 4 P. M.—Tissue Metabolism with Special Reference to Creatinin.

WEDNESDAY, APRIL 28, AT 12 M.—Protein Metabolism, with Special Reference to Uric Acid.

SATURDAY, MAY 1, AT 12 M.—The Occurrence and Significance of Phenols and Phenol Derivatives in Urine.

Guests of the University from Outside of St. Louis

PROFESSOR RUSSELL HENRY CHITTENDEN,
Sheffield Scientific School, Yale University.

PROFESSOR OTTO KNUT OLOF FOLIN,
Harvard University.

DR. SIGISMUND SCHULZ GOLDWATER,
Mt. Sinai Hospital.

PRESIDENT ALBERT ROSS HILL,
University of Missouri.

DEAN CHRISTIAN HOLMES,
University of Cincinnati.

DR. HERBERT BURR HOWARD,
Peter Bent Brigham Hospital.

PROFESSOR WILLIAM HENRY HOWELL,
Johns Hopkins University.

PROFESSOR ABRAHAM JACOBI,
Columbia University.

PROFESSOR FRANKLIN PAINE MALL,
Johns Hopkins University.

DR. SAMUEL JAMES MELTZER,
Rockefeller Institute for Medical Research.

DR. WILLIAM TOWNSEND PORTER,
Harvard University.

PRESIDENT GEORGE EDGAR VINCENT,
University of Minnesota.

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Congratulatory Letters and Addresses

[UNIVERSITY OF OXFORD]

*From the Regius Professor of
Medicine, Oxford. March 2, 1915.*

Dear Mr. President:

Sorry in these troublous days we cannot in presence through a delegate join in your rejoicings on April 29th and 30th, but we shall be with you in spirit; and may I send, on behalf of the Faculty, our warmest congratulations and best wishes?

Sincerely yours,

WILLIAM OSLER.

[UNIVERSITY OF PADUA]

Honourable Committee:

I am sorry that for special circumstances it is not possible to us to send a representation to your feasts for the inauguration of St. Louis' new institutes of medical sciences. But I assure you that I and all the medical faculty of Padua take part to them with the greatest sympathy, wishing them a continued increment for the splendour of medical sciences.

Padua, 2 April, 1915.

The President,

PROF. IGNAZIO SALVIOLI.

CONGRATULATORY LETTERS AND ADDRESSES

[UNIVERSITY OF CRACOW]

To the Corporation of Washington University and the Faculty of the Medical School.

Gentlemen:

In answer to your most courteous invitation, the Medical Faculty of the Jagellonian University, in Cracow, cannot but deeply regret that no delegate of theirs will be able to be present at the dedication of the new buildings of the Washington University Medical School.

Had circumstances permitted, our delegate would have been happy to tender our thanks to the celebrated Washington University for the kind wishes uttered fifteen years ago by its representative, on the occasion of the five hundredth anniversary of the re-establishment of our school. Those wishes we ever gratefully bear in mind.

Though separated from you by the present war—a far more stormy ocean than that which rolls between us—we are united in heart and mind with the men of science of your great nation, assembled in the Washington University. We fervently hope and desire that your Medical School may flourish and adorn the great country which has, for so many of our Polish brethren, become a second and most hospitable fatherland.

May science win many a victory in these new buildings, and may they bring relief and comfort to suffering humanity.

Very sincerely yours,

PROF. DR. ALEXANDER ROSNEY,

*Dean of the Medical Faculty of
the Jagellonian University.*

WASHINGTON UNIVERSITY MEDICAL SCHOOL

[UNIVERSITY OF BORDEAUX]

*Faculté de Médecine et de Pharmacie
Bordeaux, le 19 Mars 1915.*

Le Doyen de la Faculté à Monsieur le Président du Comité
d'inauguration de la Washington University Medical
School.

Monsieur le Président:

La Faculté de Médecine et de Pharmacie de
Bordeaux très sensible à l'invitation qui lui a été
faite, a le très vif regret de ne pouvoir, dans les
circonstances actuelles qui retiennent tous ses
membres impérieusement attachés à leur devoir de
Français, envoyer une délégation à la cérémonie
d'inauguration des nouveaux bâtiments de la
"Washington University Medical School."

Le Doyen et les Professeurs de la Faculté de
médecine de Bordeaux prient leurs Collègues
d'Amérique, avec lesquels ils expriment le désir
d'entrer en relations scientifiques et amicales,
d'agréer leurs vœux les plus sincères pour le plus
grand essor et la prospérité croissante de la nouvelle
Faculté.

Le Doyen,

D. C. SIGALAS.

[UNIVERSITY OF FREIBURG, BADEN]

*Grossherzoglich Badische Universität
Freiburg, Medizinische Fakultät.
Freiburg i. B., den 29. März, 1915.*

Dem Governing Board der Washington Uni-
versity Medical School dankt die unterzeichnete

CONGRATULATORY LETTERS AND ADDRESSES

Fakultät verbindlichst für die freundliche Einladung zur Einweihung ihrer neuen Institutsgebäude. Der Fakultät ist es zu ihrem Bedauern nicht möglich, zu dem genannten Tags seinen Vertreter zu entsenden, da zu dieser Zeit bereits die Vorlesungen des neuen Semesters beginnen. Die Fakultät hätte sonst gern die Gelegenheit wahrgenommen bei der Einweihung einer neuen Pflanzstätte medizinischer Wissenschaft in den Vereinigten Staaten, mit deren Hochschulen gerads die deutsche Wissenschaft zahlreiche und fruchtbare Verbindungen unterhält, ihre Glückwünsche zu überbringen. So kann sie nur aus der Ferne für die weitere Entwicklung der Medizinischen Fakultät in St. Louis ihre kollegialen Grüsse übersenden.

Der derselbigs Dekan der Medizinischen Fakultät,

LUDWIG ASCHOFF.

[UNIVERSITY OF COPENHAGEN]

*Det Laegevidenskabelige Fakultet,
Bredgade 62 Kjöbenhavn, den 30 March, 1915.*

To the Committee on Dedication, Washington University
Medical School.

The Medical Faculty of the University of Copenhagen begs to present its most respectful thanks to the Corporation of the Washington University and the Faculty of the Medical School for its letter of invitation.

Regretting not being able to have the honor of sending a delegate to the dedication of the new

WASHINGTON UNIVERSITY MEDICAL SCHOOL

buildings of the Washington University Medical School, the Medical Faculty of the University of Copenhagen herewith presents to the Committee on Dedication its cordial congratulations and best compliments.

Most respectfully,

JOHANNES FIBIGER, M. D.,

*Dean of the Medical Faculty of
the University of Copenhagen.*

[UNIVERSITY OF KÖNIGSBERG]

*Medizinische Fakultät der Königl. Albertus-
Universität, Königsberg i. Pr. den 20. März, 1915.*

Der Korporation der Washington-Universität und der Fakultät der Medical School zu Saint Louis spricht die unterfertigte Fakultät für die ehrenvolle Einladung zur Einweihung der Neubauten der Washington University Medical School ihren besten Dank aus. Die Zeitumstände hindern zu unserem Bedauern eine Beteiligung an der Feier, so können wir nur auf diesem Wege unsere herzlichsten Glückwünsche aussprechen in der bestimmten Ueberzeugung, das durch die neu errichteten medizinischen Unterrichtsanstalten der Washington Universität die medizinische Wissenschaft reichste Förderung erfahren wird.

Die medizinische Fakultät,

E. MEYER,

Prodekan.

CONGRATULATORY LETTERS AND ADDRESSES

[UNIVERSITY OF GENEVA]

*Université de Genève, Faculté de
Médecine. Genève, le 9 Mars, 1915.*

Monsieur le Doyen de la Faculté de Médecine de la Washington University.

Monsieur et très honoré collègue:

Votre aimable invitation à l'inauguration des nouveaux bâtiments de votre Ecole de Médecine vient de nous parvenir. Malheureusement nous entrons en ce moment dans les vacances de printemps, de sorte qu'il ne m'est plus possible de convoquer la Faculté en vue de la nomination d'un délégué.

Bien à regret, je dois donc me borner à souhaiter pleine réussite à votre fête et à vous présenter les vœux que nous formons pour la prospérité de votre Faculté.

Veillez agréer, Monsieur et très honoré collègue, l'assurance de ma considération distinguée.

WEBER.

[UNIVERSITY OF AMSTERDAM]

*Universiteit van Amsterdam, Faculteit der
Geneeskunde. Amsterdam, March the 10th, 1915.*

Aan the Committee on Dedication, Washington University
Medical School.

We regret exceedingly that the present state of affairs in Europe will not allow one of us the honor of being present and of representing our Faculty

WASHINGTON UNIVERSITY MEDICAL SCHOOL

at the dedication of the new buildings of the Washington University School. We have the pleasure of offering you our best wishes for their happy dedication. May they, for a long time to come, strive successfully to our common end: the advancement of medical science and of medical education.

For the Faculty of Medicine,

M. STRAUB,

President.

G. VAN RYNBERK,

Secretary.

[HARVARD UNIVERSITY]

The President and Fellows of Harvard College to the Corporation of Washington University and the Faculty of the Medical School.

Greeting:

Harvard University sends its heartiest congratulations to Washington University on the occasion of the dedication of the new buildings of the Medical School on the twenty-ninth and thirtieth days of April, nineteen hundred and fifteen.

In response to the courteous invitation of the Corporation and the Faculty of the Medical School of Washington University, Abbott Lawrence Lowell, LL.D., President, and Charles Allen Porter, A.M., M.D., Associate Professor of Surgery, will be delegates to convey the felicitations of Harvard University.

CONGRATULATORY LETTERS AND ADDRESSES

Given at Cambridge on the fifteenth day of April in the year of Our Lord the nineteen hundred and fifteenth, and of Harvard College the two hundred and seventy-ninth.

A. LAWRENCE LOWELL,
President.

[IMPERIAL MILITARY MEDICAL ACADEMY
OF PETROGRAD]

Petrograd, April 17, 1915.

Washington University:

The Conference and President of the Imperial Military Medical Academy at Petrograd beg the Washington University Medical School accept their sincerest wishes of prosperity for newly dedicated institution.

MAKAWJEFF,
President.
ILIGIN,
Secretary.

[THE ROYAL SOCIETY OF MEDICINE]

*The Royal Society of Medicine,
1 Wimpole Street, W., 29th March, 1915.*

The Royal Society of Medicine congratulates the Washington University on the prosperity of its Medical School, and regrets that it is unable, owing to the circumstances of the time, to send a delegate to be present at the dedication of the new buildings. Of all kinds of learning none tends

WASHINGTON UNIVERSITY MEDICAL SCHOOL

more to unite as brothers those who pursue it than medicine.

The Royal Society of Medicine offers a fraternal greeting to the Washington University on this happy occasion, and may sum up its warm good wishes in one short word of the ancient language of universities—*floreat*.

FREDERICK TAYLOR,
President.

J. Y. W. MACALISTER,
Secretary.

[UNIVERSITY OF CHRISTIANIA]

Christiania, April 27, 1915.

Washington University Medical School:

Cordial felicitations.

MEDICAL FACULTY.

[UNIVERSITY OF NEUCHÂTEL]

Neuchâtel, le 10 Mars, 1915.

Au Senat de la Washington University et à la Faculté de Médecine.

Monsieur le Recteur et Messieurs:

Nous avons l'honneur de vous accuser réception de l'invitation que vous avez bien voulu nous adresser de nous faire représenter par un délégué à l'inauguration des nouveaux bâtiments de votre Faculté de Médecine. A notre grand regret, l'éloignement

CONGRATULATORY LETTERS AND ADDRESSES

géographique et les circonstances actuelles ne nous permettent pas de nous rendre à cette aimable invitation, mais en raison même de cet éloignement et de ces circonstances elle nous touche particulièrement et nous est un témoignage précieux de votre bonne confraternité. C'est dans une parfaite réciprocité de sentiments que nous nous empressons de vous offrir, à cette occasion, nos cordiales félicitations; nous formons nos vœux les meilleurs pour que, continuant dans sa nouvelle demeure son oeuvre de recherches et de progrès scientifiques, votre Ecole de Médecine contribue toujours plus à la prospérité de votre Université et soit toujours mieux, avec elle, au service de l'humanité, un instrument pacifique de civilisation.

Veillez agréer, Monsieur le Recteur et Messieurs, les assurances de notre considération la plus distinguée.

Au nom du Sénat de l'Université,

le recteur,

BEGUÉLIN.

le secrétaire,

A. DUBIED.

[UNIVERSITY OF LONDON]

South Kensington, London, S. W.

8 March, 1915.

The Secretary to the Committee on Dedication, Washington
University Medical School.

Sir:

I am requested by the Establishment Committee of the Senate to thank the Committee on Dedi-

WASHINGTON UNIVERSITY MEDICAL SCHOOL

cation for their courteous invitation to the University to appoint a representative to attend the dedication of the new buildings of the Washington University Medical School, to be held in St. Louis on Thursday and Friday, the twenty-ninth and thirtieth days of April, 1915. The Committee regret that it has been found impossible to appoint a representative in the short time available.

I have to ask you to be so good as to convey to the Washington University, and its Medical School, the best wishes of the University of London for their continued prosperity.

I have the honour to be, Sir,

Your obedient servant,

ALFRED PEARCE GOULD,

Acting Vice-Chancellor.

[UNIVERSITY OF FREIBURG, SWITZERLAND]

Friburgi Helvetiorum die 10 mensis Martii, 1915.

A Monsieur le Recteur de la Washington University Medical School.

Monsieur le Recteur:

J'ai reçu votre aimable invitation du 1. février 1915 et je m'empresse de vous en remercier vivement au nom du Senat academique de notre Université.

Si les circonstances ne nous permettent pas d'envoyer un délégué officiel à vos fêtes d'inauguration, nous n'en prenons pas moins une vive part

CONGRATULATORY LETTERS AND ADDRESSES

à cette solennité, en vous adressant nos meilleurs vœux de progrès et de prospérité pour le nouveau temple de la science médicale élevé par l'idéalisme du peuple américain.

C'est dans ces sentiments que j'ai l'honneur de vous présenter, Monsieur le Recteur, l'expression de nos cordiales félicitations et de mes hommages très dévoués.

Le Recteur de l'Université,
G. M. MANSER.

[MISSOURI BOTANICAL GARDEN]

St. Louis, April 29, 1915.

The Board of Trustees and the Director of the Missouri Botanical Garden extend greetings and congratulations to Washington University on the occasion of the dedication of the Washington University Medical School.

GEORGE W. MOORE, EDWARDS WHITAKER,
Director. *President Board of Trustees.*

[UNIVERSITY OF FRANKFURT]

*Rector und Senat der Königlichen Universität,
Frankfurt a. M. den 9. April, 1915.*

An die Corporation of Washington University and the Faculty of the Medical School.

Die Universität Frankfurt a.M., welche am 18. Oktober 1914 eröffnet wurde und die Akademie für

Sozial- und Handelswissenschaften in sich aufgenommen hat, spricht der Corporation University und der Faculty of the Medical School ihre Glückwünsche zu der Eröffnung neuer medizinischer Gebäude in St. Louis aus. Sie bedauert lebhaft, infolge der gegenwärtigen politischen Verhältnisse nicht in der Lage zu sein, sich persönlich durch einen Delegierten bei der Einweihungsfeier vertreten zu lassen.

Der Rektor der Universität,

DR. R. WACHSMUTH,

*Professor der Physik und Direktor
des Physikalischen Instituts.*

The New Buildings of the Washington University Medical School

THE Corporation of the University, appreciating the value of the service which a medical school can give to the community, with the co-operation of the Medical Faculty, re-organized the school in all departments in 1910, and appointed heads of departments and instructors in anatomy, physiology, biological chemistry, pathology, medicine, surgery, and pediatrics, who devote themselves to teaching and research, and associated with this staff clinical instructors chosen from the medical profession of St. Louis. These changes were made with the aid of funds donated by philanthropic citizens of St. Louis.

An affiliation was established between the Barnes Hospital, the St. Louis Children's Hospital and Washington University, by which the University provides the medical staffs of the hospitals, and is permitted to use the hospitals for purposes of teaching and research. The three institutions are so related by common interests and good will, by the physical arrangement of buildings and by formal long-term contracts, that they operate as one.

The Corporation of the University and the Trustees of the affiliated hospitals agreed upon a comprehensive scheme of buildings to be erected on Kingshighway and Euclid Avenue, overlooking

WASHINGTON UNIVERSITY MEDICAL SCHOOL

Forest Park. Construction was begun in the spring and summer of 1912, and was completed in about two years. During the summer of 1914 the laboratories were moved from their old quarters on Eighteenth and Locust streets into the new buildings, and late in the fall of the same year the hospital organizations were transferred from the Washington University Hospital and the St. Louis Children's Hospital, on Jefferson Avenue, to the Barnes Hospital and to the new home of the St. Louis Children's Hospital.

The buildings occupied by the Medical School and by the hospitals affiliated with it include the following: A building for the dispensary and laboratories of the hospitals, the North Laboratory Building, the South Laboratory Building, the Barnes Hospital, the St. Louis Children's Hospital, a hospital for colored patients, and a power house. This group is now enlarged by the erection of the Nurses' Home on Kingshighway. Available space on the hospital tract and on the property of the University provides for further expansion. A students' dormitory, on Forest Park Boulevard, will be completed during the session of 1915 and 1916.

A system of corridors and tunnels connects the buildings of the group so that they are practically under one roof. The buildings are constructed with reinforced concrete throughout, the exterior of the buildings being of light gray brick. While there is some variation in the form of the several buildings in adaptation to special needs, the many

NEW BUILDINGS

parts form a harmonious design, which is an outward manifestation of the purpose to provide for the interdependent needs and activities of clinic and laboratory and to facilitate co-operation between workers in the fundamental and applied sciences of medicine. The medical laboratory buildings have been planned for the accommodation of from 240 to 300 students, and liberal provision has been made for graduate students and investigators.

BUILDING FOR DISPENSARY AND LABORATORIES OF THE HOSPITALS

The Dispensary, the Clinical Laboratory and the Department of Pathology occupy a large building 232 feet long and 60 feet wide, situated immediately adjacent to the hospitals. It consists of a basement, well lighted by large areaways, and four floors.

The Dispensary, which occupies the entire first floor and basement of this building, is the out-patient department of the Barnes and of the St. Louis Children's Hospitals, and from the Dispensary patients are admitted to these hospitals. On the first floor are the clinics of Medicine, Surgery, Pediatrics and Obstetrics, and on the basement level are the clinics of Ophthalmology, Laryngology, Rhinology, Otology, Neurology, Dermatology, Genito-Urinary Diseases, and Orthopedic Surgery. Patients enter from a single entrance on Euclid Avenue and are assigned to the various

clinics by the admitting officer at the registration desk. On each floor there is ample waiting-room space.

The Dispensary is an organic part of the Medical School, and is entirely controlled by the Corporation of the University through a committee of the Medical Faculty. As in the hospitals, the University Departments of Medicine, Surgery, Obstetrics and Pediatrics are responsible for the care of patients, and all clinical facilities are available for teaching. Laboratories and operating rooms are connected with the various clinics, and through the large and varied general service, unusual facilities for instruction are afforded. The work of all services is facilitated by the co-operation of the Department of Nursing and Social Service of Washington University.

The second floor of the building is occupied by the Clinical Laboratory, which is divided into pathological, bacteriological, physiological and chemical sections. Occupying the eastern end of the floor is a large laboratory, equipped for instruction in clinical microscopy and chemistry. There are smaller laboratories for physicians and students engaged in research.

The Pathological Laboratory of the hospitals and medical school consists of a mortuary and an autopsy room, occupying an extension of the west end of the building, and of two floors devoted to teaching and investigation in pathology. The extension, containing the autopsy room and mortuary, is connected with the hospital by a corridor.



MUSEUM OF PATHOLOGY



CLASS LABORATORY OF CLINICAL PATHOLOGY

NEW BUILDINGS

It contains a chapel in which burial services may be held. The autopsy room is provided with an amphitheatre, and in immediate contact with it is a large room which is used for the teaching of gross pathology. All drainage from the autopsy department is collected and sterilized in a large tank provided for the purpose.

On the third floor of the building is a class laboratory for bacteriology and pathology. This laboratory consists of three rooms occupying the north side of the building, each equipped for sections of twenty students. On the two floors are rooms equipped for investigation in pathological anatomy, and in chemical and physiological pathology. There are rooms for technical work in histology, for the preparation of media, store rooms and a tool room. A lecture room, seating approximately one hundred students, and provided with projection apparatus, is situated upon the fourth floor in contact with the museum. On the roof of the building are quarters for animals and rooms for experimental pathology.

The Museum of Pathology occupies a large space at the eastern end of the building and is provided with a gallery situated below the skylight. Here is housed the museum of pathology, used in the teaching of pathological anatomy, medicine and surgery.

THE NORTH LABORATORY BUILDING

The North Laboratory Building, on Euclid Avenue, opposite the Barnes Hospital, has four

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stories with basement and available attic and roof space. Within it are housed the administrative offices of the Medical School, the assembly hall, the library, and the Departments of Preventive Medicine, Experimental Surgery and Anatomy. The building is connected with the south building by corridors, and with the hospitals and power house by means of a wide passage beneath the street. The outside dimensions of the north building are approximately 209 feet from east to west by 56 feet from north to south, giving a floor area of 11,351 square feet for each story. On the first floor will be found the library, offices of the school and assembly hall. The assembly hall occupies the east end of the building, and is reached by a corridor leading from the main entrance and passing the faculty room and the administrative offices of the Medical School. It seats 350 persons and may be used for public lectures.

The Library of the Medical School occupies the west half of the first floor, a location conveniently accessible to all departments of the school. The space is divided into a stack room accommodating about 40,000 volumes, a general reading room, three specially equipped study rooms, an exhibition room containing the manuscripts and letters of William Beaumont, and the office of the librarian. A well-lighted basement furnishes ample space for store rooms and for cataloguers' work rooms.

The library contains (June 1, 1915) 19,216 bound volumes, and receives 354 of the most important medical periodicals, selected with reference



READING ROOM OF THE LIBRARY



STACK ROOM OF THE LIBRARY

NEW BUILDINGS

to the needs of students and investigators. Of these, 263 are in complete series.

On the second floor the space is equally divided between the Departments of Preventive Medicine and Surgery, the latter having here its laboratories for experimental study, which include two operating rooms with adjoining preparation and sterilizing rooms. Students are received for class work in the large laboratory of experimental surgery and there is provision for advanced workers in small laboratory rooms.

The western half of the second floor is arranged for the Department of Preventive Medicine. A bacteriological laboratory, class room and museum are designed for the needs of teaching. There are two research laboratories, rooms for maintaining constant temperature and for cold storage, a balance room, and quarters for animals.

The Department of Anatomy occupies the whole of the third and fourth floors. On the third floor are three class laboratories arranged on the north side of the building for the teaching of histology and embryology. Each will accommodate from twenty to twenty-four students. Rooms for instructors adjoin the class laboratories. At the western end of this floor are the anatomical lecture room and a small public museum, the aquarium and a laboratory for the teaching of microscopical technique. A research laboratory equipped specially for microscopical methods, a photographic laboratory, physical-chemical laboratory and technician's suite occupy the eastern half of the third floor. The

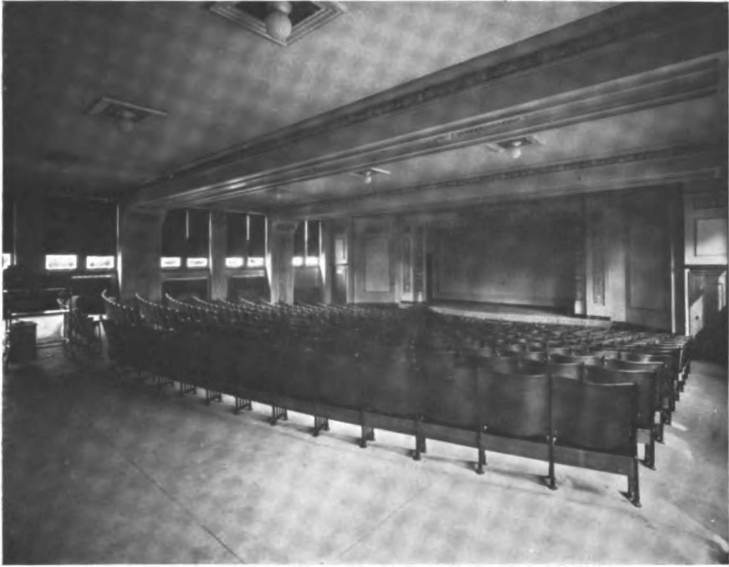
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arrangement of the fourth floor is adapted to the needs of gross anatomy. The western half is given over to the dissecting laboratory, wash room and locker rooms. The dissecting laboratory is a large chamber subdivided into four broad alcoves by the interposition of museum cases. Each alcove, lighted by high windows at one side, accommodates from eighteen to twenty students. The eastern half of this floor is occupied by laboratories for instructors, a research laboratory equipped for the methods of gross anatomy, a seminar room, a technician's suite, and draughting room. In the basement are embalming rooms and store rooms. The ample roof space has been utilized for several purposes, namely, an operating suite, a shop and store room, isolated rooms for the preparation of bones, a crematory, and quarters for animals under observation.

THE SOUTH LABORATORY BUILDING

The South Laboratory Building is of the same size and exterior design as the North Laboratory Building, with which it is connected by a corridor. Opening upon the corridor are the main entrance, public telephone booths, a lunch and recreation room, the book store, and rooms for janitor service. The south building is four stories in height and has a gross floor area of about 45,000 square feet. It accommodates the Departments of Physiology, Pharmacology and Biological Chemistry.

Almost the whole of the first floor is devoted to instruction in biological chemistry. The west end



ASSEMBLY HALL IN THE NORTH LABORATORY BUILDING



DISSECTING LABORATORY OF THE DEPARTMENT OF ANATOMY

NEW BUILDINGS

of the building contains a large class laboratory with chemical tables, hoods, sinks and other facilities for sixty students. Opening upon this laboratory, or closely adjoining, are a balance room, a dark room for work with optical instruments, a warm room, a refrigerator room, rooms for storage and for the preparation of material used by the class, and a room for centrifuges, presses and other bulky apparatus. In the rear half of the first floor are the chemical lecture room with small adjoining rooms for the preparation of lecture demonstrations, a laboratory for students taking special courses, an instructor's laboratory and rooms arranged for certain chemical work in connection with the nutrition of hospital patients. The rear of the second floor is planned chiefly for research, and contains a laboratory for advanced students, preparation rooms, two animal rooms, a seminar room, a store room and the laboratories of the members of the staff.

The Department of Pharmacology occupies the west half of the second floor and a part of the third floor. On the second floor are placed a large laboratory, lecture and preparation rooms, the laboratory of the head of the department and a room for chemical work.

The third floor is used jointly by the Departments of Physiology and Pharmacology and is devoted almost entirely to class instruction. It is divided into two class laboratories, each accommodating thirty students, a store room, a number of individual experiment rooms, rooms for special

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experiments requiring isolation and the use of permanently mounted apparatus, and a laboratory equipped for physiological optics. The students are provided with a tool room for their own work. The floor contains a suite of rooms arranged for aseptic operations.

The whole of the fourth floor is devoted to physiology. A seminar room and the lecture room, with its preparation room, are located here in close proximity to the store of apparatus and chemicals that are used conjointly for demonstrations and research. On this floor is located the shop of the Medical School, which is under the supervision of the Department of Physiology. The remainder of the fourth floor is devoted to private laboratories for the staff and for advanced workers, and contains rooms designed for special investigation.

The Department of Physiology uses space in the basement for a pier room where apparatus requiring special stability may be mounted; a research room and an aquarium adjoin this room.

Unit systems prevail not only in the general construction of the buildings, but so far as advantageous, in the fixtures and furnishings. Provision is made in all lecture rooms for the different methods of optical projection and for demonstrations involving the use of gas, water, electricity and compressed air.

The attic space extending over each building is utilized for the assembling of the air ducts from the chemical hoods and for the electric fans operating the draught. Electrically-heated steam stills



CLASS LABORATORY OF THE DEPARTMENT OF BIOLOGICAL CHEMISTRY



CLASS LABORATORY OF THE DEPARTMENT OF PHYSIOLOGY

NEW BUILDINGS

and tin-lined tanks for distilled water are located in the attic of each building, block tin pipes running from the tanks to the basement with openings on each floor. The laboratory desks and tables are of special design, and the space allowed to each student is ample. Besides the usual gas and plumbing equipment of such buildings, the various laboratories and technicians' rooms are supplied with compressed air, electric power, electric water baths, electric current of different voltages and brine for the refrigerator rooms.

THE BARNES HOSPITAL

The Barnes Hospital consists of an administration building, the medical wards, the surgical wards, a private pavilion, service buildings and a laundry. These buildings are of fire-proof construction with exterior walls of impervious light gray brick, trimmed with limestone, floors of marble tile or battleship linoleum, and interior walls of tile, enameled brick, glass or marble.

The main entrance of the administration building opens upon a spacious rotunda containing a bronze bust of the donor, Robert A. Barnes. On the one side of this rotunda is situated the general information office, the administrative offices, the trustees' room and offices of the superintendent, and on the other side are the rooms for the attending physicians. The resident medical staff is housed in the second and third stories of this building. The lecture room for the medical department is located in the two upper stories.

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To the north of this main administration building are the service buildings, containing kitchens, dining room, bakery and laundry, and rooms for hospital employees. On the top floor of the main building is the operating pavilion. There are four operating rooms, the larger being in the form of an amphitheatre. Besides dressing rooms, the attending staff has an examining suite for private cases. The large work room for the nurses has a western and southern exposure, thus insuring the best of working conditions. A central sterilizing plant just off the work room contains sterilizing accommodations for the entire hospital. There are recovery rooms and special examining rooms so located as to be easily accessible to the nursing force. Between the operating rooms are surgical wash rooms with full equipment for sterilizing of instruments, with blanket warmers and other facilities. The entire operating pavilion is supplied with sterilized water from the special tank located in this pavilion. On the first floor of the pavilion are a well-equipped receiving ward and an emergency department.

The building at the west of the hospital lot facing Forest Park both on the south and west, is the private pavilion. Its separate entrance, on Kings-highway, gives to a service with all the advantages of a general hospital the convenience of a private hospital. The arrangement of the rooms is such that patients may have single private rooms or rooms en suite with bath.

NEW BUILDINGS

The wings containing the wards of the hospitals are situated on either side of the administration building. They are three stories high and have the shape of the letter "T." With their southern exposure the wards are insured a maximum of sunlight. The service is centered at the north end and so arranged as to reduce, as far as possible, the effort of the necessary routine. On either side of the ward, at the junction of the corridors and facing south, are porches, one for convalescent patients and the other for patients in bed. By this arrangement all patients may be placed out of doors.

With the space in the private pavilion the initial capacity of the Barnes Hospital is approximately 220 beds. A sufficient space is reserved to increase this number materially.

The hospital contains numerous class rooms, laboratories, lecture rooms and examining rooms in addition to the accommodations usually found in general hospitals. Special provision has also been made for a modern equipment in the department of radiography, hydrotherapeutics and mechanotherapy; special wards and equipment are provided for the study of metabolism, and there are special laboratories for microscopical and chemical diagnosis.

All of the buildings of the hospital are connected by two corridors, one in the basement and one above ground. Service elevators are so distributed that all traffic is confined to the basement corridor. Corridors connect the hospital with the buildings

of the Medical School and with the St. Louis Children's Hospital.

THE ST. LOUIS CHILDREN'S HOSPITAL

The St. Louis Children's Hospital, which is placed on the same tract as the Barnes Hospital, immediately northwest of it, and facing Forest Park on the west, offers facilities for bedside study and instruction in the diseases of infancy and childhood, including the infectious diseases. It is built of gray brick and harmonizes in color and design with the adjacent buildings. The hospital has general medical wards, auditorium and contagious wards with the accessory equipment of each.

The building devoted to general hospital work is five stories high, with offices for the admission of patients and for other administrative purposes on the ground floors, wards for general medicine on the second floor, wards for infants on the third floor, and wards for general and orthopedic surgery on the fourth floor, research laboratories, director's suite, and rooms for the residents and internes on the fifth floor. In connection with the third floor there is a large open-air ward on the roof of the auditorium building. In this part of the hospital there are 120 beds.

The building for contagious diseases has a basement and three floors, and contains 40 beds. One of the three floors is for patients with diphtheria, one for patients with scarlet fever, and the other for patients with measles. Each of these floors is entirely separate from the others, the elevators and

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stairs being on the outside of the building. Accommodations have been made for mothers of sick children, and a few private rooms for adults with infectious diseases have been provided in this building.

Between the general hospital and the contagious building, and connected with both, there is an auditorium two stories high. The out-patient department of the hospital is located in the general out-clinic department of the Medical School.

A valuable adjunct to the St. Louis Children's Hospital is its country department, located on the Missouri Pacific Railway, one and one-half miles from Valley Park. The hospital building of this department is of brick and concrete construction and fireproof. It consists of two open wards, each to accommodate twenty-five children, overlooking the Meramec River to the south. The wings, extending to the north, provide for service and for nurses and staff quarters.

HOSPITAL FOR COLORED PATIENTS

Plans have been completed and specifications drawn for the erection of a new pavilion for colored patients; this building is to be placed on the hospital block between the Children's Hospital and the service building. Pending the completion of these quarters colored patients are being provided for in two houses situated upon the same lot with the main buildings and overlooking Forest Park. They have been renovated and such changes made as were necessary to provide for medical, sur-

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gical, obstetrical and pediatric services. The two buildings have a capacity of twenty-five beds.

THE NURSES' HOME

The Nurses' Home, in process of construction in 1915, is a building of six stories, attractively situated upon Kingshighway overlooking Forest Park. On the first floor is a large reception room, two smaller reception rooms and a class room. An elevator runs to the roof of the building. The upper floors contain bed rooms, each provided with running water, bath rooms, and a kitchenette for occasional use.

POWER PLANT

The power plant is located east of Euclid Avenue and north of the North Laboratory Building. It furnishes light, heat, power, refrigeration and compressed air to all of the buildings of the Medical School and to the Hospitals.