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HISTORY
OF THE MEDICAL CENTER

Washington University School of Medicine was formed in 1899 by the union of the first two medical schools established west of the Mississippi River, the Missouri Medical College and the St. Louis Medical College, popularly known as McDowell's College and Pope's College because of the close identification of the two schools with their respective Deans, McDowell of the Missouri Medical College and Pope of the St. Louis Medical College.

These pioneer colleges set high standards for medical education during the heyday of the medical diploma mills, when there were four times as many medical schools operating in the city of St. Louis as there now are in the entire state of Missouri. From their beginnings each school sought university affiliation. The St. Louis Medical College was established as the Medical Department of St. Louis University, became independent in 1855, and affiliated with Washington University in 1891, although it retained its name until the union with the Missouri Medical College in 1899. The Missouri Medical College was established as the Medical Department of Kemper College, was later the medical department of the University of Missouri; it finally became independent in 1857. In 1899, the Missouri Medical College affiliated with the St. Louis Medical College, and thus formed the Medical Department of Washington University.

Both colleges were particularly fortunate in attracting men of energy, integrity, and skill. Members of their faculties were well known at home and abroad. Charles A. Pope at thirty-six became the youngest president in the first hundred years of the American Medical Association, and his successor as professor of surgery at the St. Louis Medical College, E. H. Gregory, was elected president in 1886. John T. Hodgen, a graduate of the Missouri Medical College and later dean and professor of surgical anatomy at the St. Louis Medical College, was president of the American Medical Association in 1880. Hodgen originated the splint for hip fractures. The Hodgen splint is still used today.

Both colleges continued to raise their requirements, so that at the time they became associated in 1899, each required its students to complete satisfactorily a four-year graded course for the M.D. degree.

In 1909 Abraham Flexner began a survey of 155 medical schools in the United States and Canada for the Carnegie Foundation for the Advancement of Teaching. A similar survey by the American Medical Association and Flexner’s survey, the famous Bulletin Number Four on the state of medical education in the United States and Canada, created a national sensation. Some schools collapsed, others pooled their resources, while still others reorganized.

The Medical School of Washington University did not escape criticism. In the report Flexner made to Dr. Pritchett, president of the Carnegie Foundation for the Advancement of Teaching and former professor of astronomy at Washington University, he said that one of two courses must be adopted: "the department must be either abolished or reorganized."
A part of the Washington University Medical Complex: Queeny Tower, Rand-Johnson Building, Barnes Hospital administration building, St. Louis Maternity Hospital, and McMillan Hospital and Oscar Johnson Institute for Medical Research.
Dr. Pritchett mailed the report to Robert S. Brookings, a St. Louis merchant who was president of the Board of Directors of Washington University. Mr. Brookings was shocked and immediately went to New York to see Flexner, demanding proof that the conditions were as bad as described. Abraham Flexner returned to St. Louis with Mr. Brookings, and the two men went through the School. In less than two hours Mr. Brookings was convinced that drastic action was necessary if the School were to be of highest caliber.

The meeting in 1909 of Robert S. Brookings and Abraham Flexner was of unsurpassed significance in the history of the Washington University School of Medicine, for it led to the complete reorganization of the School and the establishment of the present Medical Center. Abraham Flexner inspired the dream of a model medical school. Robert S. Brookings accepted the challenge, and with the energy and vision which characterized all his enterprises, made the dream a reality.

No time was lost in making changes. The Bulletin of the Medical School for July, 1910, makes the following general statement: "The Corporation of the University, becoming convinced that in no other direction could greater service be rendered than through a great, modern medical school, determined to reorganize the School and to place it in the front rank of American medical institutions. It has called to the heads of a number of the leading departments the ablest men it could secure, who shall give their time to teaching and research, providing each with a staff of permanent assistants, who likewise give their time to instruction and research, and has associated with this staff groups of the strongest men in the medical profession in St. Louis."

When Robert A. Barnes died in 1892, he left a will which directed that the trustees of his estate should use $800,000 for the erection and equipment of a hospital "for sick and injured persons, without distinction of creed, under the auspices of the Methodist Episcopal Church, South." Investigation by the trustees into the cost of building a modern hospital convinced them that the sum was not large enough to build an efficient, fireproof building, and they therefore invested the trust. By 1912 the value had increased to two million dollars, a sum which permitted the building of a hospital and left an endowment greater than the original fund. The trustees were studying hospital construction at the time Mr. Brookings was studying medical schools.

It was apparent to everyone concerned that the two projects, the building of a medical school and the construction of a modern hospital, were so interrelated that the purpose of each would be more successfully fulfilled by an affiliation. A medical school would provide a highly trained staff and would assure the most modern methods and superior laboratory facilities for the hospital. A teaching hospital would give the patient superior care and provide the essential clinical experience consistent with modern medical teaching methods.

During the spring of 1912 construction was begun on the medical school and hospital buildings which form the nucleus of the present center. The laboratories were moved from their old quarters in downtown St. Louis into the new buildings on Euclid and
Kingshighway during the summer of 1914, and late in the fall of the same year the activities of the Washington University Hospital were transferred to the Barnes Hospital. Concomitantly, the St. Louis Children’s Hospital, then located on Jefferson Avenue, became affiliated with the School of Medicine and moved to its new quarters in the medical center.

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. The dedication ceremonies marked what Dr. William H. Welch of the Johns Hopkins University called “one of the most significant events in the history of medical education in America.” Robert S. Brookings, the one man most responsible for the reorganization, voiced the 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.”

These prophetic words of Mr. Brookings have been realized. Local, national, and international recognition has come to the School and to members of the faculty. Three members of the faculty have been given the St. Louis Award, and research done at the School has resulted in five Nobel Prizes.

In the ensuing years the medical center has continued to grow, and now its facilities are unexcelled. With the increase in the physical plant there has also occurred a great increase in the size of the faculty; the expansion has been made without compromise in the standards which marked the early development of the medical center. As a result, significant achievements in both research and clinical areas have been recorded steadily.

AIMS AND GENERAL PLAN OF INSTRUCTION

The efforts of the School are directed toward providing able students with a stimulating and challenging milieu in which they may pursue the study of medicine. Because Washington University is a private institution, its School of Medicine is not bound by any arbitrary restrictions in its admissions policy; indeed, the School seeks the most able applicants without reference to geographic, racial, or religious origin. A large scholarship program, which continues to grow, helps to make it possible for the School to lend support to able students whose personal resources might otherwise prevent them from obtaining a medical education. At any given time the student body includes representatives from most of the fifty states and from the territories and foreign countries as well.

The educational policies are such as to offer the student not only a factual back-
ground but, more importantly, the opportunity to acquire a long-term approach to medicine. In a field which is developing rapidly as is medicine, education only begins in medical school and must be considered a continuing project. It is hoped that this important concept will be inculcated in each student during his four years in the School of Medicine.

A new curriculum has just been adopted to further these ends. It is the product of a prolonged study and discussion by the faculty of the present and probable future state of medical science and medical practice, and of the influence of these on medical education. The curriculum is designed to provide our students, who enter with diverse backgrounds and interests and who will undertake a wide variety of careers, with the basic knowledge and skills essential for their further professional development. The curriculum is based upon the recognition that modern medical education can no longer hope to be comprehensive; it must be selective. At the same time, students must develop facility in the use and understanding of several related, technical languages: those of anatomy, chemistry, physiology, and clinical medicine; and they must also learn how new knowledge is acquired and how old knowledge is re-evaluated.

The curriculum includes a core experience for each student through which he may learn these fundamentals. This core experience is based upon a sequence of courses that will introduce each student to the broad panorama of medicine. The principles, the methods, the problems, and the possibilities in each of the major areas of medical science and medical practice will be presented in such a way as to help the student choose the career best suited to his interests and goals and, at the same time, understand how his area of interest is related to the other areas.

The elective program will permit the student to decide where his interests lie and to pursue these interests. It will also enable the student to benefit more fully from the wide range of specialized knowledge and abilities of the faculty. The core curriculum cannot provide enough time for each student to be introduced to each of these specialized areas, but the elective program will permit each student, according to his own interests, to become exposed to more of these areas.

The major curriculum changes include the greatly expanded elective program, the new courses in Genetics and Radiology, the revised and expanded courses in Pathophysiology, the increased co-ordination between the courses in Pathophysiology and those in Pathology and Pharmacology, the increased co-ordination between the courses in Neuroanatomy and Neurophysiology, and the generally more satisfactory sequence of all the preclinical courses.

Each academic year is thirty-six weeks long, except for the third year, which is forty-eight weeks long. The first two years are divided into semesters, while the third year is divided into quarters. The fourth or elective year may be divided in different ways depending upon the electives chosen.
A view of the Renard Hospital, David P. Wohl, Jr., Memorial—Washington University Clinics, David P. Wohl, Jr., Memorial Hospital, and the Nurses Residence.
MEDICAL SCHOOL BUILDINGS

The School is located along the eastern edge of Forest Park in the center of the city and is served by convenient public transportation; its site thus combines the advantages of pleasant surroundings and easy accessibility.

The laboratories and lecture rooms of the preclinical departments are housed in two wings of the main building of the School and in the West Building. The North Building contains the offices of the Vice Chancellor and the Dean, the Medical School library, an auditorium, and the facilities of the Department of Anatomy. The Cancer Research Wing houses other administrative offices, the bookstore, and numerous research laboratories. In the South Building are the Departments of Biochemistry, Physiology and Biophysics, and Pharmacology. The Departments of Microbiology, Pathology, and Preventive Medicine each occupy a floor in the West Building. The Student Health Service is also located in this building. The Biomedical Computer Center and the Department of Physical Therapy are situated in the McKinley Avenue Building.

THE HOSPITALS AND LABORATORIES

Adjacent to the Medical School building proper are the following hospital facilities:

The Barnes Hospital. This unit, which constituted the first hospital structure in the center, has grown from 150 beds to its present total of 551. Included are the medical and surgical wards, representing about half of the total number of beds, as well as the floors on which are available beds for semiprivate and private patients. In the extensive operating suite, all of the general surgical procedures as well as those relating to neurosurgery, thoracic surgery, urologic surgery, plastic surgery, orthopedic surgery, and gynecologic surgery are performed. The new Queeny Tower has three floors of beds. A large central diagnostic laboratory, under the direction of the Medical School staff, provides diagnostic service to all of the medical center. In the Barnes Hospital there is also a large cafeteria for the professional staff and the medical students.

The McMillan Hospital, including the Oscar Johnson Institute for Medical Research. This building is owned by the School of Medicine, but like all the hospitals within the medical center proper with the exception of St. Louis Children’s Hospital, it is operated by the Director of Barnes Hospital. In it are 168 beds for the treatment of patients whose diseases fall in the fields of ophthalmology or otolaryngology. A small number of general medical patients are also admitted to the McMillan Hospital. The operating rooms and outpatient clinics of both the Departments of Ophthalmology and Otolaryngology are situated in the McMillan Hospital. The Oscar Johnson Institute, occupying the top five floors of the building, provides unexcelled research facilities for the above two departments, and for the Division of Neurology as well.

The St. Louis Maternity Hospital. Now owned by the University, this hospital became affiliated with the University in 1923, and moved to its present quarters in the
medical center in 1927. Its 114 beds are devoted to ward, semiprivate, and private obstetrical and gynecologic patients. There are 78 corresponding facilities for newborns, including a unit for premature infants. The building also houses the research facilities of the Department of Obstetrics and Gynecology.

The St. Louis Children's Hospital. With the newly completed facilities there are now 164 beds for the care of infants and children. Also available are new outpatient facilities and extensive clinical and research laboratories for the Department of Pediatrics.

Edward Mallinckrodt Institute of Radiology. This unit, one of the largest and best equipped in the world, houses the diagnostic, therapeutic, and research activities of the Department of Radiology. The Institute, which is University owned, is connected on most of its floors with the adjoining Barnes and Barnard Hospitals, and through them with the other hospitals of the center, thus providing easy access for all inpatients. Many important advances, including the development of cholecystography by the late Dr. Evarts A. Graham and his associates, have been made at the Mallinckrodt Institute.

David P. Wohl, Jr., Memorial Hospital. The Wohl Hospital contains 81 beds for the care of medical and surgical patients, and also provides excellent new laboratories and offices for the Departments of Medicine and Surgery. Within the building are located a large amphitheatre, several small classrooms, and a student lounge.

Barnard Free Skin and Cancer Hospital. This building provides 44 beds for the treatment of indigent patients suffering from skin diseases and tumors. The Barnard Hospital has had a long and notable history, and its recent affiliation with the University medical center constitutes an important step in the development of both institutions.

Renard Hospital. The Renard Hospital, opened in 1955, provides 104 beds for patients with psychiatric diseases and also affords new laboratories and offices for the Departments of Psychiatry and Neurology.

The Irene Walter Johnson Institute of Rehabilitation provides training for personnel in rehabilitation procedures, facilities for treatment of disabled persons in the St. Louis metropolitan area, and an active research program relating to chronic diseases.

The David P. Wohl, Jr. Memorial—Washington University Clinics building was opened in May, 1961. Five floors of the building are used for Washington University Clinics and five floors are devoted to facilities for research. In addition a 225-seat amphitheatre is located on the ground floor.

The Seven Hundred South Euclid and the 724 South Euclid buildings provide space for the Biomedical Computer and Computer Research Laboratories, the Division of Biostatistics, the Department of Hospital Administration, the School of Physical Therapy, and several research laboratories.
In addition to the above named facilities which make up the Washington University Medical Center proper, patients are available for teaching purposes in the following hospitals:

- The various hospitals operated by the City of St. Louis, including two general hospitals: the St. Louis City Hospital with 679 beds, Homer G. Phillips Hospital with 607 beds; and Koch Hospital for tuberculosis.
- Malcolm Bliss Psychopathic Hospital with 210 beds.
- Cochran Veterans Administration Hospital with 513 beds.
- St. Luke's Hospital with 380 beds.
- St. Louis County Hospital with 344 beds.
- The Jewish Hospital of St. Louis with 530 beds.
- Ellis Fischel State Cancer Hospital, Columbia, Missouri, with 104 beds.

All members of the staffs of the various hospitals in the Washington University Medical Center hold University appointments, and the Medical School nominates members of its faculty to the staffs of the various municipal hospitals.

STUDENT ACTIVITIES

Although the demands of the medical curriculum impose a greater load on students than they usually face in undergraduate schools, there are opportunities for extracurricular activities, among which the following are of interest:

**Washington University Medical Society.** This society, whose membership includes the faculty and all students, holds four meetings yearly, at which members present investigative work being carried on at the Medical School. In addition, in the spring of each year, the Senior Research Assembly is held for the purpose of enabling senior students to report on original research completed at any time during their four years in the School.

**Athletic Facilities.** Excellent facilities for indoor and outdoor sports are available on the main campus. The gymnasium in the Spencer T. Olin Residence Hall is available for the use of medical students.

**Social Fraternities.** Two national medical fraternities are represented by chapters at the School. Each year distinguished scientists are invited to present the two guest lectureships sponsored by these organizations.

Within the University community, excellent concerts, lectures, and other cultural activities are open to students in the School of Medicine. The city of St. Louis offers many cultural and recreational facilities, among which are the City Art Museum, the Missouri Botanical Garden, the Museum of the Missouri Historical Society, and the Planetarium. The St. Louis Symphony Orchestra offers a series of concerts during the season.
In 1963 a gift from Mr. and Mrs. Evarts Graham, Jr., enabled the Medical School to establish the Graham Colloquium, a series of informal discussions led by outstanding scholars from fields other than medicine and the biological sciences. Mr. Graham's purpose was concordant with that of the School: to encourage opportunities for students to expand their views on social, philosophical, artistic, and political topics. Discussions with the invited guests, selected by the students, are held at night in the Olin Hall lounge. In keeping with the intention of having an informal and lively exchange of views, refreshments are served and participation by wives and faculty is invited.

Although not required by all states for licensure, an internship in an approved hospital is considered essential preparation for the practice of medicine, and most graduates seek additional experience by serving as residents and later as fellows for periods up to five years.

In order to aid students in obtaining desirable intern appointments, an active counseling program is maintained by the Associate Dean. Thus, in their junior year, students are provided with general background information regarding the type of organization of the internships available. Since many more openings exist than there are candidates in any given year, students are able to exert a considerable measure of selection.

An open file is maintained in the Associate Dean's office wherein are kept brochures and other descriptive data regarding internships throughout the country; included are evaluations of their own appointments, obtained from recent graduates.

The School participates in the National Intern Matching Program, which represents an important advance in internship selection and offers distinct advantages to applicants.

The School maintains an active interest in its graduates and is pleased to support them in subsequent years as they seek more advanced training or staff appointments in the communities in which they settle.

THE LIBRARY

The School maintains one of the largest medical libraries in the Midwest. Housed on four floors in the North Building are more than 100,000 volumes of books and journals; a rare book collection; the School's early archives; and manuscript copies of the scientific papers of several outstanding people, including Drs. William Beaumont, E. V. Cowdry, Joseph Erlanger, Evarts Graham, Leo Loeb, Philip Shaffer, Robert J. Terry, and others. The small Martin Silberberg Memorial Collection on Art and Medicine is also maintained. Card catalogues and computer print-outs are the keys to the collection. Exhibits of the Library's possessions are presented regularly. The Library also publishes a Library Guide and its Library Notes. The latter appears eight times yearly and presents news of the Library and of the literature of medicine.
The Library is entered from the second floor of the North Building, where are found the main reading room, circulation and reference desks, and staff offices. Copying machines for the use of readers are available on this floor.

The Library is open to all serious students for consultation, but persons not connected with the Medical Center may not borrow material for use elsewhere. The Library publishes computer-based indexes to its holdings. PHILSOM and PHILSOMS are computer-based lists of its journals; its Catalog of Books appears quarterly and is cumulated annually in published form; and an Index to the William Beaumont, M.D. Manuscript Papers is also available.

Members of the staff include Dr. Estelle Brodman, Librarian and Professor of Medical History, Mrs. Doris Bolef, Mrs. Miwa Ohta, Mr. Terence Cassidy, and others.

Library hours are 8:30 a.m. to 12 p.m. on weekdays; 8:30 a.m. to 6:00 p.m. on Saturdays, and 1:00 to 10:00 p.m. on Sundays.

When the Medical Library added its 100,000th volume, the event called for a celebration. At the party Dr. Estelle Brodman, the librarian, showed Dr. Carl Harford and the presidents of the four classes some of the recent acquisitions.
1968-69

Registration for all new students, Wednesday, September 11, 1968.
Registration for all former students, Friday, September 13, 1968.
Examinations for advanced standing and removal of conditions, Wednesday, September 11, and Thursday, September 12, 1968.
Academic year begins Monday, September 16, 1968.
Christmas recess, Saturday, December 21, 1968, at 1:00 p.m. to Monday, January 6, 1969, at 8:00 a.m.
Registration for second half-year, Monday, January 27, 1969.
Holidays, Good Friday, April 4, and Saturday, April 5, 1969.
Senior Research Program, Wednesday, March 26, 1969.
Academic year ends Saturday, June 7, 1969.
Commencement, Monday, June 9, 1969.

1969-70

Summer session begins June 23; ends September 13, 1969.
Registration for all new students, Wednesday, September 10, 1969.
Registration for all former students, Friday, September 12, 1969.
Academic year begins Monday, September 15, 1969.
Christmas recess, Saturday, December 20, at 1:00 p.m. to Monday, January 5, 1970, at 8:00 a.m.
Holidays, Good Friday, March 27, and Saturday, March 28, 1970.
Academic year ends Saturday, June 6, 1970.
Commencement, Monday, June 8, 1970.
ENTRANCE REQUIREMENTS

Entrance requirements to the School of Medicine are:

(1) Character, attitude, and interest suitable to carrying out the duties of a physician.

(2) Intellectual ability and achievement, indicated by satisfactory scholastic work prior to entering medical school.

(3) Completion of a minimum of three years of college courses in an approved college or university. At least 90 semester hours of acceptable credit must include minimum subject requirements as follows:

- **English**: 6 semester hours
- **Chemistry**: 15 semester hours, including experience in the techniques of quantitative analysis and a minimum of 4 hours of organic
- **Physics**: 8 semester hours
- **Biology**: 8 semester hours, at least 4 hours of which must be in zoology

(4) Applicants are expected to have taken the Medical College Admissions Test of the Association of American Medical Colleges.

Success in the study of the basic medical sciences depends upon a solid background of factual and conceptual knowledge of chemistry, biology, physics, and mathematics. The requirements listed above are a bare minimum, and the applicant is encouraged to take additional course work in the sciences in the areas of particular interest to him. Quality of performance is stressed rather than quantity of course work undertaken. No college course work in mathematics is required, but the majority of our successful applicants have had mathematical training in differential and integral calculus. Courses in embryology, comparative anatomy, and physical chemistry or their equivalent are advised.

The rest of the college work should be chosen with the object of developing the intellectual talents of the individual rather than as required professional preparation. The work should include courses in language and literature, history, the social sciences, or other subjects that may afford a foundation for cultural development.

The Committee on Admissions feels that communication skill, in both written and verbal usage of the English language, is an important requisite in medicine. The student’s proficiency in English is appraised by evaluating the short essay each applicant is asked to write, in the personal interview; by the score on the verbal section of the Medical College Admissions Test, and by college English course grades.

Applications should be filed as soon as possible after July 1 of the year preceding that in which admission is sought. In requesting an application blank or a Bulletin, it is necessary that you furnish us with your zip code. The deadline for application to the entering class is November 30.
ADMISSION TO ADVANCED STANDING

Applicants who have satisfactorily completed one or two years of study at another approved medical school may be accepted for admission to the second- or third-year class (when vacancies exist), provided:

1. That they comply with the requirements above stated for admission to the first-year class.
2. That courses equivalent in general content and duration to those in this School in the years for which credit is asked have been satisfactorily completed.
3. That at the discretion of the Committee on Admissions, examinations may be required in any subjects already covered.

An applicant for admission to the upper classes must have studied as a matriculated medical student in an acceptable medical school for a period at least equal to that already spent by the class to which admission is sought.

ADMISSION OF GRADUATES IN MEDICINE

Applicants who hold the M.D. degree are not accepted as candidates for that degree except under unusual circumstances.

GRADING SYSTEM

1. Each student will receive information concerning his achievement in terms of the following designations: Honors, Pass, Fail.
2. Depending on the curricular and instructional characteristics of the various courses, one of three systems of grade reporting will be submitted to the Dean’s office by the course master for each particular subject:
   - Category I encompasses a letter-grade pattern on the basis of A (Excellent), B (Very Good), C (Satisfactory), D (Passing but Poor), I (Incomplete), K (Condition), W (Withdrawal), Au (Audit), Df (Deferred), and F (Failure). An asterisk (*) denotes honors work.
   - Category II pertains to courses of the elective year and other subjects employing a similar pattern: H (Honors), P (Pass), and F (Failure).
   - Category III is employed in offerings of relatively limited contact for which no specific letter-grade will suffice: NG (No Grade).

One of these categories will be selected for each course for each report to the Dean’s office. The official transcript of credit indicates the student’s mark in each subject and a distribution table of the frequency of marks assigned in each division of the category involved.
STANDING AND PROMOTION

The procedure for action on promotion and standing or graduation is as follows:

1. Upon the completion of a course, each department reports to the Dean's office a grade for each student in the class in the proper category of grade reporting. The grade and designation may be based upon attitude and performance as well as upon examination grade. For the elective year, grades are accompanied by specific, substantive, qualifying remarks on the basis of the evaluative criteria for such course work.

2. For each class there is a Committee on Promotions which periodically reviews the records of all students in that class and acts in accordance with the following rules:
   (a) A student having recorded failures in two major subjects will be required to withdraw from the class. (b) A student who, at the end of any year, has only one failure recorded in a major department will be required to remove this failure as directed by the department concerned. When and if the failure is removed, the Committee on Promotions will consider the student's entire record. A student who has recorded a second failure in the attempt to remove a first failure will be required to withdraw from his class.
   (c) No student shall be promoted to the third year until there is satisfactory credit for all required subjects of the first and second year.
   (d) Under exceptional circumstances the promotions committees may suggest to the Dean and to the Committee on Admissions and Scholarships that a student be allowed to repeat certain courses as a special student or to repeat the work of the entire year as a member of the next class.

The registration of a student may be canceled at any time if in the opinion of the faculty his further attendance is deemed undesirable. A prorata refund of the tuition will be made in such cases.

REQUIREMENTS FOR DEGREES

DOCTOR OF MEDICINE

A course of medical education for the M.D. degree consists of a minimum of four years of study. The academic years vary in length, being no less than 36 nor more than 48 weeks in duration. For selected students who are interested in an investigative or research concentration, a five-academic-year program may be arranged subject to the approval of the Committee on Medical Education.

Candidates must be more than twenty-one years of age and of good moral character; they must have attended not less than four academic years of instruction as matriculated medical students; they must have passed all required courses, or their equivalent, and have received satisfactory grades in the work of the entire four academic years; and they must have discharged all current indebtedness to the University.

At the end of the fourth or fifth academic year, students who have fulfilled these requirements will be recommended for the degree of Doctor of Medicine. Candidates must be present when the degrees are conferred.
Bachelor of Arts (Combined Program)

A student who enters the School of Medicine with three years of work in the College of Arts and Sciences of Washington University may become a candidate for the Bachelor of Arts degree at the end of the first year in the School of Medicine. Under this combined program he must fulfill the premedical requirements and:

1. He must have completed at least 90 academic units in liberal arts courses, with a minimum grade-point average of 1.0.
2. He must have completed all of the General Requirements and at least 15 additional units in advanced courses¹ in not more than three departments. These units will satisfy a part of the A.B. requirements relative to advanced courses.
3. In addition to completing at least 90 units of work in the College of Arts and Sciences, a student in the combined program must also satisfactorily complete the first year in the Washington University School of Medicine.
4. A transfer student, to be eligible for the degree of Bachelor of Arts under the combined plan, must complete at least the last 30 units of A.B. work in full-time residence in the College of Arts and Sciences of Washington University. He must also fulfill all other conditions.
5. A candidate for the A.B. degree under the combined program must be recommended by the Dean of the School of Medicine to the Dean of the College.

Medical Scientist Training Program

For details of this new program, see page 195.

Fees and Other Expenses

The University reserves the right to change the fees herein stated at any time without notice. Whenever a change is made, it will become effective with the next installment due. All fees and charges are payable in advance at the Office of the Registrar of the School of Medicine. Checks should be made payable to "Washington University."

¹A course on the 300 or 400 level may not be counted as advanced unless it is passed with a grade of C or higher. Courses numbered 301-302 and 401-402 in Aerospace Studies or Military Science may not be counted as advanced courses, nor may courses be taken in a division of the University other than the College or the Graduate School of Arts and Sciences.
FEES AND EXPENSES

TUITION Fee. For first degree students the present tuition is $1,800, payable in two equal installments, at the beginning of the first and second semesters.

HEALTH Service Fee. A health service fee of $55.00 per semester is charged to all students. The fee covers complete medical examination on entering the School and continued medical care and X-rays are provided. One or more physicians are available at designated times for consultation at the Student Health Clinic, and a physician is available for emergency care in the Barnes Hospital emergency room or the student's room when necessary. Hospital care is provided in the services of Barnes Hospital. A liberal group hospitalization insurance policy is provided which will pay all necessary costs for most hospitalizations (see the Student Health Information Booklet for details). The student or his family is responsible for meeting the costs of hospital care in excess of those paid by this policy. The responsibility of the Student Health Service for hospitalization costs will end thirty days after a hospitalized individual ceases to be an officially enrolled student.

PARKING Fee. Students who park automobiles on the Medical School lots are required to pay a parking fee.

MICROSCOPE AND DIAGNOSTIC Instruments

Each student is required to possess a standard microscope. A student may purchase a microscope or may rent one through the School of Medicine Bookstore. The rental cost of $75 a year for a SICO monocular microscope includes insurance against all risks of direct loss or damage. In the event of such loss or damage, the student will pay only the first $25 of such cost. The microscope may be purchased at the end of any rental period. One-half of the rental cost will be credited against the purchase price. The present cost of the SICO monocular is $225.

The requirements for a microscope are relatively simple, and any of a wide variety of makes and models is equally satisfactory. In addition to obtaining a microscope that possesses good quality lenses and is in good working order, it is necessary that it be equipped with substage condenser, three objectives (approximately 10X, 40X, and oil immersion 90X), and fine as well as coarse focusing. A mechanical stage is useful, as is a very low power objective, either as a separate lens or as a portion of the 10X lens. It is unnecessary to buy a binocular microscope; monocular models magnify just as well. Microscopes do not wear out rapidly, and a used microscope in good condition is as useful as a new one and much less expensive. From these considerations it should be clear that it is not necessary to go heavily in debt to buy a microscope.

All students are required to provide themselves with stethoscopes, ophthalmoscopes, otoscopes, hemocytometers, percussion hammers, tape measures, flashlights, head mirrors, and skin pencils as the need for them arises.

Supplies and books may be purchased at the bookstore located in the Medical School.
The Spencer T. Olin Residence Hall.
ESTIMATE OF EXPENSES (1968-69)

An estimate of the average annual expenses of a student in the School of Medicine, excluding the cost of clothes, laundry, microscope, and incidentals, is given below. The amount will vary considerably, according to the individual.

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<tr>
<th>Service</th>
<th>Cost</th>
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<tr>
<td>Tuition</td>
<td>$1,800</td>
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<tr>
<td>Health Service Fee</td>
<td>$110</td>
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<tr>
<td>Books and Instruments</td>
<td>$150 to $250</td>
</tr>
<tr>
<td>Room, Board, and Incidentals</td>
<td>$1,700 to $2,200</td>
</tr>
</tbody>
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Total Expenses: $3,760 to $4,360

WITHDRAWALS AND REFUNDS

A student who withdraws within the first two weeks of classes is charged 20% of the tuition fee; a student who withdraws during the third week is held for 40% of the charges; a student who withdraws during the fourth week is held for 60% of the charges; a student who withdraws during the fifth week is held for 80% of the charges. There is no refund of any portion of the tuition fee after the fifth week. No special fees are refundable after the second week of the term.

REGISTRATION

Registration for the first half-year of 1968-69 is scheduled for Wednesday, September 11 (new students) and Friday, September 13 (former students); for the second half-year, Monday, January 27, 1969.

Previously matriculated students who fail to register on any of the days set aside for that purpose will be charged a fee of $5.00.

THE SPENCER T. OLIN RESIDENCE HALL

The Spencer T. Olin Residence Hall was made possible by generous gifts from Spencer T. Olin, alumni of the School of Medicine, and friends of the School.

This residence, located at 4550 Scott Avenue in the Medical Center, has accommodations for 295 single men and women students. No University housing for married students is available at the present time. The interior arrangement is much like a modern hotel. The main floor has a mail room, letter boxes, and a large lounge. The ground floor has a snack bar, a laundry, and meeting rooms. A two-story gymnasium is available for use of the residents.

A nondenominational chapel, the gift of the Danforth Foundation, a lounge on the second floor for women students, the gift of William S. Bedal in memory of his mother, Dr. Adelheid C. Bedal, and a nonmedical library, a gift from the estate of Mary G. Reber, are available for use by the students.
Each of the upper floors has fifteen single bedrooms, seven double bedrooms, and two two-room suites. The second and third floors accommodate women students exclusively. A penthouse on the roof has a large room for dances and other social activities. Rooms are assigned for the academic year, and no resident is permitted to transfer the assignment of his room or to allow occupancy by any other person.

Each occupant is required to pay a $25 security fee in addition to the room rental fee. This fee will be held by the University until termination of residence to cover losses resulting from possible damage to the room or to the furniture. Any portion not so used will be refunded.

The rates for rooms are as follows:

**School year: September to June (9 months)**
- $525 per student in 2-room suite
- (2 students per suite)
- 475 for student in single room
- 400 per student in double room

**Daily Rates for Visitors**
- $6.00 per person in 2-room suite
- 5.00 per person in single room
- 4.00 per person if undergraduate student, prospective student, or graduate student

**Summer: For Three Months**
- $175 per student in 2-room suite
- 160 per student in single room
- 125 per student in double room

**Summer: Weekly Rates**
- $14.75 per student in 2-room suite
- 13.50 per student in single room
- 10.50 per student in double room

### STUDENT RESEARCH FELLOWSHIPS

A considerable number of research fellowships are awarded each year to students who undertake to do research projects under the direction of a faculty member. These fellowships, the number of which varies from year to year, are supported by funds provided by the United States Public Health Service, the Lederle Laboratories, the Tobacco Industry Research Committee, and others. In addition, the John and Mary Markle Foundation has provided funds for several of the preclinical departments to support additional staff members whose functions are to advise and consult with students interested in special research opportunities. Each year, at the Senior Research Assembly, the results of student research are presented before the Faculty and student body. Each year, also, a number of articles are published in which student research is presented to the scientific public. The Student Research Fellowships carry a stipend of $600, and are awarded for a minimum period of two months. They may be undertaken by any student after admission to the Medical School and during any vacation period. Application should be made to the Committee on Special Awards which supervises this program.
Comprehensive in scope, the financial aid program of the School of Medicine encompasses scholarships, loans, fellowships, student assistantships, and numerous prizes and awards. As students accepted for admission have proven scholastic ability, scholarships are awarded primarily on a basis of financial need. Immediately upon notification of acceptance for admission, the applicant may file for financial aid in the form of scholarship and/or loan support. First- and second-year students are urged not to accept employment during the academic year. A number of third- and fourth-year students find employment in hospitals within the Medical Center. No student is permitted to leave the School because of financial reasons, and every assistance is afforded to the student to avoid excessive indebtedness. The Personnel Office provides assistance in finding employment to students' wives who possess teaching, nursing, secretarial, or laboratory skills.

Requests for financial assistance each year are greater than the funds available. Awards are made on the basis of comparative need, as accurately as can be determined by the Committee on Financial Aid from information provided. All information given in the application or in the interview is held in strict confidence within the Committee. Scholarship and loan funds can be awarded only if it is apparent that the applicant has restricted his expenditures to a practical minimum, and only if he has made every reasonable effort to obtain the necessary financial support as gifts or loans from his family or other sources.

All awards are made for a given academic year; however, students may renew their financial assistance for the four years of medical school if they remain in good academic and personal standing, and if there is continued financial need. Awards made to individual students by the Committee on Financial Aid may vary from year to year depending upon the student's needs and upon the availability of funds to the Committee. Students are responsible for filing applications for renewal of awards in the spring of the year. Medical students married to classmates should submit a single application, together with financial statements from each student's parents.

The Committee holds that students receiving assistance have an obligation to notify the Committee if their financial situation changes, such as obtaining employment or receiving a scholarship award not anticipated at the time the application was submitted. Many students who consider themselves independent of their parents successfully arrange clearly specific loans from the parents, having recognized the very real fact that a medical school cannot be held responsible for assuming the financial support of students whose family resources are quite capable of providing necessary financial support. In this light the student is required to provide a realistic and detailed analysis of his anticipated expenses and income resources as specified in the application for financial aid which is available from the Registrar of the School of Medicine.

Applications for all fellowships, scholarships, loans, and assistantships may be made to the Registrar. The awards are made by the Chancellor on the recommendation of the Dean.
THE AMERICAN MEDICAL ASSOCIATION LOAN PROGRAM makes available bank loans without collateral but at a comparatively high interest rate to medical students, interns, or residents who are citizens of the United States. Applications for such loans are made through the Education and Research Foundation of the American Medical Association.

THE HEALTH PROFESSIONS STUDENT LOAN FUND was established by federal legislation for medical students with a demonstrated financial need and is available to eligible students in the School of Medicine for long term loans at favorable rates.

THE URSALA HECKER LOAN FUND was established by a bequest from Ursala Lee Hecker for the use and benefit of worthy, deserving, and needy medical students.

THE G. H. REINHARDT MEMORIAL SCHOLARSHIP FUND. Through the bequest of G. H. Reinhardt, an amount of $100 is available to each of four deserving students during their second year.

SCHOOL OF MEDICINE LOAN FUND was established for the purpose of providing financial assistance in the School of Medicine.

THE ISABEL VALLE BROOKINGS SCHOLARSHIP AND LOAN FUND. Through the gift of Isabel Vallé Brookings (Mrs. Robert S.), the income from this fund is available for scholarships and loans in the School of Medicine.

W. K. KELLOGG FOUNDATION LOAN FUND. A generous gift has been made by the W. K. Kellogg Foundation to provide financial assistance to well qualified medical students in need of such aid. A limited number of loans are available from this fund.

THE ALINE RIXMAN LOAN FUND. Provided through the gift of William Rixman, the fund is used to alleviate the unexpected financial emergencies that arise among medical students during the academic year. The fund is available to any student who, in the judgment of the Dean, gives promise of becoming a competent physician. It is expected that loans will be repaid within a reasonable time after the student has finished his training.

JACK ADLER FOUNDATION SCHOLARSHIP provides a scholarship in the School of Medicine.

GRACE STRONG COBURN SCHOLARSHIP. Through the bequest of Mrs. Grace Strong Coburn, the income from an endowment fund is to be used by the School of Medicine for the purpose of providing scholarships to aid worthy individuals engaged in the study of medicine or in improving their knowledge of medicine.
THE T. GRISWOLD COMSTOCK SCHOLARSHIPS. Through the bequest of Marilla E. Comstock, two scholarships are available for students who would otherwise be unable to obtain a medical education and who desire and intend to follow the practice of medicine and surgery.

THE DANFORTH MEDICAL FUND. The Danforth Foundation, Inc., and the late William H. Danforth have given a substantial sum to further and promote the acquisition and dissemination of the knowledge of medical science and to support research and new discoveries in basic and clinical medicine and surgery. The principal and income of the fund shall be used to furnish scholarships, fellowships, outright grants, or other financial assistance to talented and promising young men and women engaged or preparing to engage in such fields of study and endeavor. Mr. Danforth established a Danforth Medical Fund Committee, which consists of Dr. Glover H. Copher, Chairman, Dr. Samuel B. Grant, and Dr. James Barrett Brown.

The persons to whom or for whom funds shall be made available shall be proposed by the Committee on Scholarships and Loans of the School of Medicine and shall be finally selected and determined with the advice and consent of the Danforth Medical Fund Committee.

THE DR. CHARLES DRABKIN SCHOLARSHIP FUND provides an income from a specific bequest for the periodic award of a scholarship in the School of Medicine.

THE ANDREW AND SUSIE FLEMING SCHOLARSHIP is a permanent endowment, the income of which is made available to worthy and necessitous students.

THE GEORGE F. GILL SCHOLARSHIP, instituted in memory of a former Clinical Professor of Pediatrics, entitles the holder to a partial tuition remission.

MR. AND MRS. WILLIAM GREENBERG SCHOLARSHIP FUND. Through the gift of Mr. and Mrs. William Greenberg, a scholarship has been made available for a medical student.

THE HEALTH PROFESSIONS SCHOLARSHIP FUND enables talented students from low-income families to undertake the course of study required to become physicians or doctors in health professions.

THE JACKSON JOHNSON FUND. Under the will of Jackson Johnson, a large sum was given to the University, the income to be used "to aid worthy and desirable students in acquiring and completing their medical education." During recent years, the income from this fund has been devoted to Honor Scholarships named for the donor, as well as to fellowships for needy students.

These Honor Scholarships are awarded on a regional basis, with one or more scholarships being awarded annually to students from each of the following areas:
The Jackson Johnson Regional Scholarships have been established to enable young men and women with superior qualification and promise for a career in medicine to come to Washington University without regard to their financial circumstances.

**Eligibility.** Jackson Johnson Regional Scholarships are open to those who plan to enter the freshman class at the Washington University School of Medicine or to transfer from a two-year medical school to the third-year class at Washington University. The candidate must have resided for three years before application in one of the specified regions, and must have completed premedical work or the first two years of medicine in the same region.

**Stipend.** Since the Jackson Johnson Regional Scholarships are regarded as prizes to be competed for by all students, the stipends will vary with the financial resources of the students. If there is no financial need, a scholarship without stipend will be awarded. The maximum stipend will be $1,800 a year.

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Regional Scholarships are open to those who plan to enter the freshman class at the Washington University School of Medicine or to transfer from a two-year medical school to the third-year class at Washington University. The candidate must have resided for three years before application in one of the specified regions, and must have completed premedical work or the first two years of medicine in the same region.

**Stipend.** Since the Jackson Johnson Regional Scholarships are regarded as prizes to be competed for by all students, the stipends will vary with the financial resources of the students. If there is no financial need, a scholarship without stipend will be awarded. The maximum stipend will be $1,800 a year.
FINANCIAL ASSISTANCE

Selection. The awards will be made by the Committee on Admissions and Scholarships with the approval of the Chancellor on the basis of the academic record in college or medical school, the score on medical aptitude and other tests, the recommendations of professors and others concerning ability, character, qualities of leadership, and general all-around development, and the extracurricular activities both in and outside the School.

Renewals. Awards may be renewed with the same or different stipends for the succeeding years of the medical course provided the achievements of the scholar justify the continuance of the award. The School may withdraw a Jackson Johnson Regional Scholarship if at any time the student's record or his actions in the School or outside prove him unworthy of it.

Application. All students accepted for admission are considered for the Jackson Johnson Regional Scholarships, making it unnecessary to file a special application.

The Eliza McMillan Scholarship Fund. The Eliza McMillan Scholarship Fund provides a trust fund, the income from which is used in assisting young girls to secure an education and thereby the means of supporting themselves.

The Medical Alumni Scholarship Award is applied on the payment of the medical tuition fee and is given for excellence in work during the preceding scholastic year on the recommendation of the Committee on Loans and Scholarships and the president of the Medical Alumni Association.

The Roy B. and Viola R. Miller Memorial Fund. Through the bequest of Roy B. Miller, an endowment income is available for scholarships for medical students and for postgraduate study and research for such students as seem to be especially capable for performing, through their study and work, things that would definitely benefit mankind.

The Ophthalmology Scholarship Fund provides support for needy students of ophthalmology.

Pfizer Laboratories Medical Scholarship Program annually awards a scholarship to a medical student of high scholastic standing who is in financial need.

The Robert Allen Roblee Scholarships. Through the gift of Mrs. Joseph H. Roblee, the income from an endowment fund provides one or more scholarships for qualified, worthy, and deserving students.

The Thomas W. and Elizabeth J. Rucker Scholarships. Through the bequest of Eugenia I. Rucker, the income from the Thomas W. and Elizabeth J. Rucker Scholarship Endowment provides scholarships for students in the School of Medicine.

Joseph H. Scharf Scholarship. Through the annual income of a bequest of Dr. Joseph H. Scharf, scholarships for worthy and needy students in the School of Medicine are made available.
SCHOOL OF MEDICINE SCHOLARSHIP FUND. Gifts from various donors are used to furnish a scholarship for a qualified, worthy, and deserving student.

THE DR. JOHN B. SHAPLEIGH SCHOLARSHIP. From a bequest of Dr. John B. Shapleigh, supplemented by contributions by Mrs. Shapleigh and Miss Margaret Shapleigh, a fund has been established, the income from which is used to pay the tuition of students in need of assistance.

THE ALEXANDER BALRIDGE SHAW SCHOLARSHIPS. Through the bequest of Roy A. Shaw, the annual income from this fund, given in memory of his father, Dr. Alexander Balridge Shaw, may be used for scholarships in the School of Medicine.

THE BEULAH B. STRICKLING SCHOLARSHIP, a bequest of Mrs. Beulah B. Strickling, has been made to the School of Medicine for scholarships.

THE TEAMSTERS LABOR-MANAGEMENT CHARITABLE FOUNDATION SCHOLARSHIP FUND is available for scholarships in the School of Medicine.

EDWARD H. AND VIRGINIA H. TERRILL SCHOLARSHIP FUND. The income from a bequest of Dr. Edwin H. Terrill is available for scholarships for medical students.

THE ALEXANDER AND GERTRUDE BERG FELLOWSHIP. Through the bequest of Mrs. Gertrude Berg, there has been established an endowment fund for a fellowship in the Department of Microbiology.

JACKSON JOHNSON FELLOWSHIPS IN THE PRECLINICAL SCIENCES. In order to provide opportunities for able and promising young men and women, three Jackson Johnson Fellowships in the Preclinical Sciences will be awarded annually.

Eligibility. All applicants must be graduates of a recognized school of medicine and acceptable for admission to the Graduate School of Arts and Sciences of Washington University as candidates for a doctoral degree. Preference will be given to those who expect to pursue an academic career in one of the preclinical sciences.

Stipend. The stipend varies with the needs and ability of the individual to a maximum of $2,000 a year for the first year.

Renewal. Awards may be renewed with the same or different stipends, not to exceed three years in all, provided the achievements of the fellow justify continued study.

Application. All applications should be completed by March 1 for the period beginning the following July or September. Awards will be announced about April 1.

STUDENT RESEARCH FELLOWSHIPS. A considerable number of research fellowships are awarded each year to students who undertake research projects under the direction of a faculty member. These fellowships, the number of which varies from year to year, are supported by funds provided by the United States Public Health Service, the Lederle Laboratories, the Tobacco Industry Research Committee, and others. Each year, at the
FINANCIAL ASSISTANCE

Senior Research Assembly, the results of student research are presented before the Faculty and student body. Each year, also, a number of articles are published in which student research is presented to the scientific public. The Student Research Fellowships carry a stipend of $600, and are awarded for a minimum period of two months. They may be undertaken by any student after admission to the Medical School and during any vacation period. Application should be made to the Committee on Special Awards.

Student Assistantships are available in a number of departments in the School. Information may be obtained from the heads of the departments concerned.

William H. Danforth Loan Fund for Interns and Residents in Surgery. This program provides financial assistance in the form of loans for graduate students in surgery.

The George W. Merck Memorial Loan Fund. Through the gift of the Merck Company Foundation, a loan fund is available to encourage deserving interns and residents to seek the best possible postgraduate training.

Frank R. Bradley Scholarship Loan Fund. Established in 1958 by the Alumni Association of the Graduate Program in Hospital Administration in honor of Dr. Frank R. Bradley, this program provides a loan fund for students enrolled in the Graduate Program in Hospital Administration.

The Bertha Reinhardt Green Memorial Fund. This loan fund was established by a bequest of Mrs. Bertha Reinhardt Green for students enrolled in the Department of Occupational and Recreational Therapy.

W. K. Kellogg Foundation Loan Fund for Graduate Students in Hospital Administration. This loan fund was initially established in 1958 and supplemented in 1964.

W. K. Kellogg Foundation Loan Fund for Students in Physical Therapy provides loans to a limited number of Physical Therapy students.

The Mrs. Mary A. Lennon Memorial Scholarship Loan Fund in Hospital Administration was established in 1958 by Mrs. Maureen Lennon Callaghan and Lieutenant Colonel Donald E. Callaghan for qualified applicants majoring in Hospital Administration.

Social and Rehabilitation Administration Traineeships in Occupational Therapy provide tuition funds and a monthly stipend for a limited number of students in Occupational Therapy.

Social and Rehabilitation Administration Traineeships in Physical Therapy. Since 1961 the Department of Physical Therapy has received an annual grant for a limited number of traineeships which provides a monthly stipend and tuition funds.


**Alpha Omega Alpha Fraternity Prize** is awarded at the end of the fourth year to the member of that class who has made the highest average for the entire medical course.

**Alpha Omega Alpha Fraternity Prize for Student Research** is awarded to the student who submits the best thesis on a research problem.

**The Baker Laboratories, Inc., Nutritional Award** is given annually to the student who has done the most outstanding work in nutrition, preferably but not necessarily in the field of pediatrics.

**The Alexander Berg Prize** is awarded to a student of high general standing who presents the best results in research in bacteriology.

**The Borden Undergraduate Research Award** is made to that member of the graduating class who, during any year while enrolled in the School, has carried out the most meritorious undergraduate research.

**The Jacques J. Bronfenbrenner Prize**, given by his students in memory of his inspiring accomplishment as a teacher and scientist, is awarded to the member of the graduating class who, in the judgment of the Chairman of the Department of Medicine, has done the most outstanding work in his class in the field of infectious diseases or related fields.

**The Dr. Richard S. Brookings and Dr. Robert Carter Medical School Prizes.** Through a bequest of Robert S. Brookings, an endowment fund has been established, the income of which is to be used for annual prizes or awards for medical students. At the present time these prizes are awarded for meritorious research or other performance carried on by students enrolled in the School of Medicine.

**The Kehar S. Chouké Prize** is awarded at the end of the first year to a medical student who has demonstrated superior scholarship in anatomical work.

**The Carl F. and Gerty T. Cori Prize in Biochemistry** is awarded at the end of the first year to the member of the class who has demonstrated superior scholarship in biochemical work.

**The Antoinette Frances Dames Prize in Physiology and Biophysics** is awarded annually to a member of the first-year class who has demonstrated superior scholarship in these fields.

**George F. Gill Prizes:**

1. One prize is awarded at the end of the first year to the member of the class who has demonstrated superior scholarship in anatomical work.
2. One prize is awarded to a member of the graduating class, of high general standing, who had shown especially good scholarship in the Department of Pediatrics.

**The Dr. Joseph J. Gitt and Charlotte E. Gitt Prize** is awarded to a senior student for the best original work in the field of clinical and therapeutic medicine. The award shall be left to the decision of all of the department heads of clinical services acting as a committee.

**LANGE MEDICAL PUBLICATIONS BOOK AWARDS** are given to members of all four classes for high scholastic standing and achievement in research.

**The Howard A. McCordock Book Prize** is awarded at the end of the second year to a member of that class for general excellence in pathology.

**The Missouri State Medical Association Award** of a scroll and a U. S. Savings Bond is presented annually to an honor graduate of the senior class.

**The C. V. Mosby Company Book Awards** are made to five members of the graduating class for high general scholastic standing and research achievement.

**The National Foundation Merit Award** is given to the medical student who is judged by the School of Medicine to have written the best thesis or the equivalent on any subject relating to birth defects.

**The Prize Fund of the Medical Fund Society:**

1. One prize is awarded annually to the student of the senior class who shall, in the opinion of the faculty, have excelled in the study of internal medicine, provided, however, that no student shall be eligible for this prize who has not been a bona fide student of medicine in the School of Medicine of Washington University for the full junior and senior years.

2. One prize is awarded annually to that student of the senior class who shall, in the opinion of the faculty, have excelled in the study of surgery, provided, however, that no student shall be eligible for this prize who has not been a bona fide student of medicine in the School of Medicine of Washington University for the full junior and senior years.

It is stipulated that no individual shall be eligible for both prizes.

**The Roche Award** of a scroll and a gold wrist watch is presented at the end of the second year to the student who best exemplifies the ideals of the modern American physician.

**The Sidney I. Schwab Book Prizes** are awarded at the end of the fourth year to members of that class for general excellence in neurology and psychiatry.
THE UPJOHN ACHIEVEMENT AWARD is an annual award given to the senior student who, in the opinion of an administrative committee representing the Dean's office, has done the most meritorious work during his medical school career in the field of metabolism.

HUGH M. WILSON AWARD FOR MERITORIOUS WORK IN RADIOLOGY. The income from the Hugh M. Wilson Fund, established in 1968, provides an annual prize to be given to a graduating medical student in recognition of meritorious work in radiology-related subjects, either clinical or basic science.

THE JAMES HENRY YALEM PRIZE IN DERMATOLOGY, established through the generosity of Charles Yalem, is awarded annually to a member of the senior class for outstanding work in dermatology.

THE DANFORTH FOUNDATION FELLOWSHIPS are available to promising graduate-level young men and women engaged or preparing to engage in fields of study and endeavor which further and promote the acquisition and dissemination of the knowledge of medical science and which support research and new discoveries in basic and clinical medicine and surgery.

THE C. E. AND M. K. HOVEY FELLOWSHIP FUND provides a fellowship for a needy and deserving intern or resident in the Washington University School of Medicine Center group.

J. ALBERT KEY FELLOWSHIP FUND provides a stipend for a fellow in orthopedic surgery.
LECTURESHIPS

Leo Loeb Lecture. Provided by the Mu Chapter of the Phi Beta Pi Fraternity.

Robert J. Terry Lectureship. Established by alumni "for the purpose of fostering greater appreciation of the study of human anatomy."

Major G. Seelig Lectureship. Established by friends in the field of surgery in honor of Dr. and Mrs. Seelig.

George H. Bishop Lectureship. Supported by funds made available by friends interested in the advancement of neurology.

Philip A. Shaffer Lectureship. Founded by friends of Dr. Shaffer in recognition of his accomplishments in biochemistry.

Samuel B. Grant Visiting Professorship. Established to provide annually a visiting professorship in the Department of Medicine.

Harry Alexander Visiting Professorship. An annual visiting professorship in the Department of Medicine has been established by former house officers and friends of Harry Alexander.

Alexis F. Hartmann, Sr., Lecturehip. Established by friends interested in pediatrics to provide an annual lecture in Dr. Hartmann's honor.
Students are divided into small groups for laboratory discussions. Here Dr. Albert Roos, Professor of Physiology and Research Professor of Anesthesiology, chats with a section of first-year medical students.

Research by students is encouraged and some grants are made available to assist them during periods of vacation. Here Dr. Klahr, of the Department of Internal Medicine, is aided by a first-year student in his renal experiments.
# CLASS SCHEDULE • FIRST YEAR • 1968-69

## FIRST SEMESTER—September 16, 1968, through February 1, 1969

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<tr>
<th>Hours</th>
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<td>9 to 10</td>
<td>Anatomy</td>
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*"Free" time after the eleventh week.

## SECOND SEMESTER—February 3, 1969, through June 7, 1969

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# Class Schedule - Second Year - 1968-69

## First Semester—September 16, 1968, through February 1, 1969

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<tr>
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<td>Pathology</td>
<td>Phys. Diag.</td>
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## Second Semester—(First 9 weeks) February 3, 1969, through April 5, 1969

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<tr>
<td>10 to 11</td>
<td>Radiology</td>
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<td>Eye/Ent</td>
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<td>Surgery</td>
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<td>Pharmacology</td>
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<td>Pathophys.</td>
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## Second Semester—(Second 9 weeks) April 7, 1969, through June 7, 1969

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<td>Eye/Ent</td>
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## MEDICINE SERVICE

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<tr>
<td>9 to 10</td>
<td>Group A—Summer Quarter, June 24 through September 14, 1968.</td>
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<td>Group D—Fall Quarter, September 16 through December 7, 1968.</td>
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<td>11 to 12</td>
<td>Group C—Winter Quarter, December 9-21 and January 6 through March 15, 1969.</td>
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<td>Ob. &amp; Gyn.</td>
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<td>4 to 5</td>
<td>Medicine Clinic</td>
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## SURGERY SERVICE, 12 weeks

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<td>4 to 5</td>
<td>Medicine Clinic</td>
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PEDIATRIC SERVICE, 6 weeks; OBSTETRICS AND GYNECOLOGY SERVICE, 6 weeks

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<td>Group C—Summer Quarter, June 24 through September 14, 1968.</td>
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<tr>
<td>10 to 11</td>
<td>Group B—Fall Quarter, September 16 through December 7, 1968.</td>
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<tr>
<td>11 to 12</td>
<td>Group A—Winter Quarter, December 9-21 and January 6 through March 15, 1969.</td>
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<tr>
<td>12 to 1</td>
<td>Group D—Spring Quarter, March 17 through June 7, 1969.</td>
<td>Lectures 12 to 1:30</td>
<td>C P C</td>
<td>Ob. &amp; Gyn.</td>
<td>Medicine Clinic</td>
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<td>1 to 2</td>
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<td>2 to 3</td>
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<td>3 to 4</td>
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<td>4 to 5</td>
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PSYCHIATRY SERVICE, 6 weeks; NEUROLOGY SERVICE, 3 weeks; ENT SERVICE, 2 weeks; EYE Service, 1 week

<table>
<thead>
<tr>
<th>Hours</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
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<tbody>
<tr>
<td>9 to 10</td>
<td>Group D—Summer Quarter, June 24 through September 14, 1968.</td>
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<tr>
<td>10 to 11</td>
<td>Group C—Fall Quarter, September 16 through December 7, 1968.</td>
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<tr>
<td>11 to 12</td>
<td>Group B—Winter Quarter, December 9-21 and January 6 through March 15, 1969.</td>
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<tr>
<td>12 to 1</td>
<td>Group A—Spring Quarter, March 17 through June 7, 1969.</td>
<td>Lectures 12 to 1:30</td>
<td>C P C</td>
<td>Ob. &amp; Gyn.</td>
<td>Medicine Clinic</td>
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</table>
ELECTIVE YEAR. This is a 48-week year, but each student is required to attend for only 36 weeks.

"A" electives

"B" electives

<table>
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<tr>
<th>6 weeks</th>
<th>6 weeks</th>
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<th>6 weeks</th>
<th>6 weeks</th>
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<th>6 weeks</th>
<th>6 weeks</th>
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</table>

"A" Electives

These seminar courses will take 2 to 4 hours a week for 12 or 18 weeks, and most will be given in the late afternoon on Tuesdays and Thursdays in order to facilitate scheduling and planning. Each student must complete at least two of these courses to graduate. Most students will take these seminars concurrently with "B" electives, but selected students could take them during semesters two, three, or four.

"B" Electives

These electives include advanced clinical clerkships in any of the clinical departments, research in any department, and other special full-time courses in Preventive Medicine (nutrition, outpatient medicine) or Anatomy (special dissection), etc. Most students will take "B" electives after completing the clinical year, but these electives could precede the clinical year, or be interspersed among the quarters of the clinical year. An individual student might even decide to take his elective year after completing semesters one and two.
<table>
<thead>
<tr>
<th>Year 1</th>
<th>Clock Hours</th>
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<tbody>
<tr>
<td>Anatomy</td>
<td>432</td>
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<tr>
<td>Physiology</td>
<td>234</td>
</tr>
<tr>
<td>Biochemistry</td>
<td>216</td>
</tr>
<tr>
<td>Microbiology</td>
<td>180</td>
</tr>
<tr>
<td>Biostatistics</td>
<td>54</td>
</tr>
<tr>
<td>Genetics</td>
<td>36</td>
</tr>
<tr>
<td>Topics in Clinical Medicine</td>
<td>36</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,188</strong></td>
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<tr>
<th>Year 2</th>
<th>Clock Hours</th>
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<tr>
<td>Pathology</td>
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<tr>
<td>Pathophysiology</td>
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<tr>
<td>Infectious Diseases</td>
<td>54</td>
</tr>
<tr>
<td>Cardiovascular and Renal Diseases, Fluid and Electrolyte Balance, Respiratory Disorders</td>
<td>54</td>
</tr>
<tr>
<td>Nervous System Disorders</td>
<td>54</td>
</tr>
<tr>
<td>Metabolic Disorders, Gastroenterology, Nutrition, Hematology, Developmental Biology</td>
<td>72</td>
</tr>
<tr>
<td>Pharmacology</td>
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<tr>
<td>Physical Diagnosis</td>
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<tr>
<td>Laboratory Diagnosis</td>
<td>54</td>
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<tr>
<td>Clinical Diagnosis</td>
<td>54</td>
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<tr>
<td>Surgery</td>
<td>36</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>36</td>
</tr>
<tr>
<td>Obstetrics and Gynecology</td>
<td>36</td>
</tr>
<tr>
<td>Radiology</td>
<td>36</td>
</tr>
<tr>
<td>Psychiatry</td>
<td>36</td>
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<tr>
<td>Neurology</td>
<td>18</td>
</tr>
<tr>
<td>Ophthalmology and Otolaryngology</td>
<td>18</td>
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<tr>
<td>Preventive Medicine</td>
<td>18</td>
</tr>
<tr>
<td>History of Medicine</td>
<td>18</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,188</strong></td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>Year 3: Clinical Year</th>
<th>Clock Hours</th>
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</thead>
<tbody>
<tr>
<td>Medicine</td>
<td>462</td>
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<tr>
<td>Surgery</td>
<td>462</td>
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<tr>
<td>Obstetrics and Gynecology</td>
<td>231</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>231</td>
</tr>
<tr>
<td>Psychiatry</td>
<td>231</td>
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48
### TABLE OF REQUIRED HOURS

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<th>Subject</th>
<th>Hours</th>
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<tr>
<td>Neurology</td>
<td>115½</td>
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<tr>
<td>Otolaryngology</td>
<td>77</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>38½</td>
</tr>
</tbody>
</table>

**Total for four years**: 1,848

**Year 4: Elective**

Each student must take at least 36 weeks of Type B full-time courses (usually either a clerkship or research) and at least two Type A courses (seminars or lectures which meet two or more hours each week for 12 or 18 weeks).

**Total for four years**: 5,412
DEPARTMENTS OF
THE SCHOOL OF MEDICINE

ANATOMY

BIOLOGICAL CHEMISTRY

INTERNAL MEDICINE — DERMATOLOGY

MICROBIOLOGY

NEUROLOGY

OBSTETRICS AND GYNECOLOGY

OPHTHALMOLOGY

OTOLARYNGOLOGY

PATHOLOGY

PEDIATRICS

PHARMACOLOGY

PHYSIOLOGY AND BIOPHYSICS

PREVENTIVE MEDICINE — PUBLIC HEALTH

PSYCHIATRY

RADIOLOGY

SURGERY

BIOMEDICAL COMPUTER LABORATORY

51
Doctors Robert Laatsch, Maxwell Cowan, and Allen Enders discuss research they are conducting utilizing the electron microscope.

DEPARTMENT OF ANATOMY

The anatomical sciences are presented in three required courses (gross anatomy, microscopic anatomy, and neuroanatomy) and elective courses. The lectures for microscopic anatomy and gross anatomy are integrated into a common series encompassing general and developmental anatomy as well as cell, tissue, and organ structure. Clinical demonstrations, supervised by members of other departments, and a series of review sessions supplement the lectures. Emphasis is placed upon the biological relationships of morphology to other disciplines of medical science. Lectures, demonstrations, and laboratory teaching are used to call attention to the results of recent investigations and to acquaint students with the current literature. There are facilities for special work in gross anatomy, physical anthropology, embryology, neuroanatomy, cytology, histochemistry, and electron microscopy.
Professor and Head of the Department

W. Maxwell Cowan, B.Sc. (hon.), Witwatersrand University, 1952; Ph.D., Oxford University, 1956; M.B.B.Ch., 1958.

Professor

Estelle Brodman (Medical History in Anatomy), A.B., Cornell University, 1935; B.S., Columbia University, 1936; M.S., 1943; Ph.D., 1953.

Professors Emeriti

Walter P. Covell, B.S., Oregon State College, 1922; M.S., 1923; Ph.D., University of Minnesota, 1926; M.D., University of Chicago, 1933. (See Department of Otolaryngology)

Edmund V. Cowdry, A.B., University of Toronto, 1909; Ph.D., University of Chicago, 1912.

Mildred Trotter, A.B., Mount Holyoke College, 1921; Ph.D., 1924; Sc.D. (hon.), Western College, 1956; Sc.D. (hon.), Mount Holyoke College, 1960. (See Department of Radiology)

(Also Lecturer)

Associate Professors

Cecil Marvin Charles, A.B., University of Kentucky, 1926; M.S., 1927; Ph.D., Washington University, 1929; M.D., 1933. (See Department of Medicine)

Adolph I. Cohen, B.S., City College of New York, 1948; M.A., Columbia University, 1950; Ph.D., 1954. (See Department of Ophthalmology)


Milton N. Goldstein, B.S., Western Reserve University, 1946; M.S., 1947; Ph.D., 1952.

Roy Reed Peterson, A.B., University of Kansas, 1948; Ph.D., 1952.

Associate Professor Emeritus

Valentina Sunzceff, M.D., Women's Medical Institute (Petrograd, Russia), 1917. (Cancer Research)

Assistant Professors


Lorraine Lake, B.S., Washington University, 1950; M.A., 1954, Ph.D., 1962. (See Departments of Physical Therapy, Preventive Medicine, and Institute of Rehabilitation)

William F. Marovitz, B.A., University of California, 1962; Ph.D., 1966. (See Department of Otolaryngology)


Instructor

David N. Menton, B.S., Mankato State College, 1959; Ph.D., Brown University, 1966.

Consultant

Juan M. Taveras (Radiology), B.S., Normal School of Santiago, Dominican Republic, 1937; M.D., University of Santa Domingo, 1943; M.D., University of Pennsylvania, 1949.

Research Assistants

Oliver H. Duggins, B.S., Northwestern University, 1934; M.S., 1936; Ph.D., Washington University, 1953.


Lydia E. Thomas, B.S. (Nursing), Simmons College, 1957.
FIRST YEAR

(501). Gross Anatomy. The course is based on dissection of the human body. An extensive collection of dissected specimens is housed in the dissecting rooms so that students may easily compare their dissections with museum specimens. X-ray equipment and films are used to complement the current dissections; cine-radiographs are presented regularly. Fresh organs are provided for demonstration and dissection at appropriate times. Special attention is given to surface anatomy. Students examine each other and are encouraged to learn as much as possible from the living subjects. Occasional attendance at autopsies is recommended. Frequent discussions are held with small groups of students. 189 hours.

(506). Microscopic Anatomy. The structure of cells, tissues, and organs is studied with regard to the functional significance of the morphological features. The laboratories consist of the study of prepared slides, of preparations of fresh tissues, and of electron micrographs. Each student is required to have his own microscope. 153 hours.

(507). Neuroanatomy. This course is devoted to a study of the central nervous system. The principal tracts and nuclei are discussed in lectures, studied in the laboratory by means of dissections, prepared slides, and photographs, and related to the functions of the nervous system by lectures, discussions, and demonstrations. The lectures and laboratories are interspersed with the relevant portions of the physiology course. 90 hours.

ELECTIVE COURSES

Morphological Basis of Cell Biology. A seminar course with a revolving subject. The subject for 1968-69 will be Secretion. (Staff)

Anatomy of Surgical Approaches. A dissection review of the anatomy of specific regions of the body by way of surgical routes. (Drs. Peterson, Laatsch)

Anatomy of the Fetus and Child. Dissection of the stillborn fetus. Emphasis on normal and abnormal anatomy of thoracic and abdominal regions and principles and patterns of growth. (Drs. Peterson, Trotter)

Research. Properly qualified individuals are encouraged to carry on research in the anatomical sciences with the guidance of the Anatomy Department Staff.

Note. The numbers in parentheses indicate that the course carries credit in the Graduate School of Arts and Sciences and may be found under that number in the Bulletin of that School.
The department offers a first-year course in biological chemistry for students of medicine and for students in the Graduate School of Arts and Sciences. Students of medicine, as well as graduate students, are afforded the opportunity to pursue research work under the direction of the staff. Facilities are provided for research on the preparation and properties of enzymes, the mechanism of their action, and on the metabolism of carbohydrates and proteins. Some summer research fellowships are offered to students of medicine.

**Professor and Head of Department**


**Distinguished Service Professor**

Carl F. Cori, M.D., University of Prague, 1920; Sc.D., Yale University, 1946; Sc.D., Western Reserve University, 1946; Sc.D., Boston University, 1948; Sc.D., Cambridge University, 1949; Sc.D., Washington University, 1966. (On leave of absence)

**Professors**

David H. Brown, B.S., California Institute of Technology, 1942; Ph.D., 1948.

Carl Frieden, B.A., Carleton College, 1951; Ph.D., University of Wisconsin, 1955.

Luis Glaser, B.A., University of Toronto, 1953; Ph.D., Washington University, 1956.
Associate Professors
George R. Drysdale, B.S., Birmingham-Southern College, 1948; M.S., University of Wisconsin, 1950; Ph.D., 1952.

Research Associate Professor
Barbara Illingworth Brown (Established Investigator of the American Heart Association), B.A., Smith College, 1946; Ph.D., Yale University, 1950.

Assistant Professors
Leonard J. Banaszak, B.S., University of Wisconsin, 1956; M.S., Loyola University, 1961; Ph.D., 1961. (See Department of Physiology and Biophysics)
Philip W. Majerus, M.D., Washington University, 1961. (See Department of Medicine)
Garland R. Marshall, B.S., California Institute of Technology, 1962; Ph.D., Rockefeller University, 1966. (See Department of Physiology and Biophysics)

F. Scott Mathews, B.S., University of California, 1955; Ph.D., University of Minnesota, 1959. (See Department of Physiology and Biophysics)
David F. Silbert, A.B., Harvard University, 1958; M.D., 1962.

Research Assistant Professor
Paul W. Preisler, B.S.Chem.E., Washington University, 1923; M.S., 1925; Ph.D., 1927; LL.B., St. Louis University, 1954.

Instructor
John Elovson, Ph.D., University of Lund, 1965.

Research Instructor

Lecturer
Walter Gibson Wiest, A.B., Brigham Young University, 1948; Ph.D., University of Wisconsin, 1952. (See Department of Obstetrics and Gynecology)

Research Assistant
Carmelita Lowry, B.S., University of Illinois, 1944.

First Year

(503). Biological Chemistry. Lectures, conferences, and laboratory work covering those portions of the subject which are of especial importance to the student of medicine. First semester. 216 hours. Graduate student credit, 10 units; lectures only, 4 units.

Elective Courses

(505). Enzyme Mechanisms. Current concepts of enzyme activity with reference to the mechanism of enzyme catalyzed reactions and to kinetic theory. Three class hours a week. Credit 3 units.

(506). Selected Topics in Intermediary Metabolism. The regulation of metabolic pathways, protein-protein interactions, the biosynthesis and interconversions of various carbohydrates and lipids.

Note—The numbers in parentheses indicate that the courses carry credit in the Graduate School of Arts and Sciences and may be found under that number in the Bulletin of that School.
Macromolecules. Topics to be covered include the structure of proteins and nucleic acids and discussion of instrumentation related to determination of their physical properties. Three class hours a week. Credit 3 units.

Research opportunities are offered in the following general areas of Biochemistry:

- Biochemical studies in lipid metabolism. (Dr. Vagelos)
- Protein structure and function. (Dr. Bradshaw)
- Biochemical investigation of metabolic disorders of carbohydrate metabolism. (Dr. B. Brown)
- Studies of pathways of carbohydrate metabolism in mammalian tissues. (Dr. D. Brown)
- Mechanism of enzyme reactions. (Dr. Drysdale)
- Relationship of protein structure and enzyme activity. (Dr. Frieden)
- Kinetic theory and applications to enzyme reactions. (Dr. Glaser)
- Biosynthesis of cell wall structures and mechanism of sugar transformations in micro-organisms. (Dr. Narahara)
- Regulation of carbohydrate metabolism in muscle. (Dr. D. Brown)
- Investigation of fatty acid metabolism and membrane biochemistry through techniques of biochemical genetics. (Dr. Silbert)
- Biochemical transformations of steroid hormones. (Dr. Wiest)
- X-ray analysis of enzyme structure. (Dr. Banaszak)
- Mechanism of biosynthesis of lipids in mammalian systems. (Dr. Majerus)
- Conformation and chemistry of polypeptide hormones. (Dr. Marshall)
- Crystal structure and conformation of proteins. (Dr. Mathews)

Biochemistry Seminar. An advanced course organized as a series of seminars designed to encourage interdepartmental contact between students and staff of all departments. Topics to be considered in depth will be selected from (1) carbohydrates, (2) amino and nitrogen metabolism, (3) proteins, (4) lipids, (5) co-enzymes, (6) regulation of cellular processes, (7) energy relationships and kinetics, and (8) cellular permeability and transport mechanisms. As appropriate, additional topics in biology will be introduced. Ordinarily required of all graduate students in the Department. Hours and credit to be arranged.

Note—The numbers in parentheses indicate that the courses carry credit in the Graduate School of Arts and Sciences and may be found under that number in the Bulletin of that School.
Dr. Carl V. Moore, Head of the John Milliken Department of Medicine, is accompanied by residents and students on ward rounds.
For the purposes of both teaching and research, the Department of Medicine is divided into specialty divisions under the following directors:

Arthritis and Connective Tissue Diseases  Dr. Osterland
Cardiovascular Disease  Dr. J. Smith, Dr. Brent Parker
Dermatology  Dr. A. Eisen
Gastroenterology  Dr. M. Peterson
Hematology  Dr. E. B. Brown, Jr.
Hypertension  Dr. H. M. Perry
Immunology  Dr. Charles Parker
Infectious Diseases  Dr. Harford
Malignant Disease  Dr. Reinhard
Medical Genetics  Dr. Sly
Endocrinology and Metabolism  Dr. Daughaday, Dr. Kipnis
Nutrition  Dr. Shank
Peripheral Vascular Disease  Dr. Wessler
Psychosomatic Medicine  Dr. Guze
Pulmonary Diseases  Dr. Pierce
Renal Disease  Dr. N. Bricker

Instruction in Medicine commences with the first trimester of the second year and continues throughout the third and fourth years of the curriculum. The teaching of the second year has two main objectives: first, the correlation of the basic sciences with the clinical aspects of disease, and second, training in the technical methods of physical examination and laboratory diagnosis. By the beginning of the third year the student is prepared for supervised clinical study of individual patients in the wards.

A junior clerkship in Medicine of twelve weeks is served on the nursing divisions of the Barnes Hospital Private Medical Service, at the St. Louis City Hospital (Starkloff Division), at the St. Louis Jewish Hospital, or at the Veterans Administration Hospital; six weeks are spent on each of two of the above services. Senior students may elect to take a six-week clerkship on the Barnes Hospital Ward Service or at the Jewish Hospital; formal instruction in medical therapeutics is given during this period and responsibility is graded to be greater than during the junior clerkship. A twelve-week outpatient clerkship is also offered as an elective during the senior year.

Busch Professor and Head of the Department
John E. and Adaline Simon Professor
Stanford Wessler, B.A., Harvard University, 1938; M.D., New York University, 1942.

Professors
Neal S. Bricker, A.B., University of Colorado, 1945; M.D., 1949.
Hugh Chaplin, Jr., A.B., Princeton University, 1945; M.D., Columbia University, 1947.
(See Department of Preventive Medicine and Public Health and Institute of Rehabilitation)

William H. Danforth, A.B., Princeton University, 1947; M.D., Harvard University, 1951.

William H. Daughaday, A.B., Harvard University, 1940; M.D., 1943.

Herbert R. Donke (Public Health), S.B., University of Chicago, 1939; M.D., 1942; M.P.H., Harvard University, 1948; D.P.H., 1959. (See Department of Preventive Medicine and Public Health) (Hospital Commissioner of St. Louis and Acting Director of Health and Hospitals)

Carl G. Harford, A.B., Amherst College, 1928; M.D., Washington University, 1933.

M. Kenton King, B.A., University of Oklahoma, 1947; M.D., Vanderbilt University, 1951. (See Department of Preventive Medicine and Public Health)

David M. Kipnis, A.B., Johns Hopkins University, 1945; M.A., 1949; M.D., University of Maryland, 1951.

John Esben Kirk, M.D., University of Copenhagen, 1929. (See Gerontology)

Gerald T. Perkoff, M.D., Washington University, 1948. (City Hospital) (See Department of Preventive Medicine and Public Health)

Edward H. Reinhard, A.B., Washington University, 1935; M.D., 1939. (See Department of Radiology)

Robert Ely Shank, A.B., Westminster College, 1935; M.D., Washington University, 1939. (See Department of Preventive Medicine and Public Health)


Professor (Clinical)

Edward Massie, A.B., Washington University, 1931; M.D., 1935.

Professors Emeriti (Clinical)

Harry Louis Alexander, A.B., Williams College, 1910; M.D., Columbia University, 1914.

Clinton Welsh Lane (Dermatology), A.B., St. Mary's College (Kansas), 1916; M.D., St. Louis University, 1921.

Associate Professors

Louis V. Avioli, B.A., Princeton University, 1933; M.D., Yale University, 1937. (Jewish Hospital)

Elmer B. Brown, Jr., A.B., Oberlin College, 1946; M.D., Washington University, 1950.

Harold O. Conn, B.S., University of Michigan, 1946; M.D., 1950. (Sabbatical from Yale University School of Medicine)

Arthur J. Eisen (Dermatology), B.A., University of Buffalo, 1951; Sc.M., Brown University, 1953; M.D., University of Pennsylvania, 1957.

Albert B. Eisenstein, A.B., University of Missouri, 1941; M.D., Washington University, 1944. (See Department of Preventive Medicine and Public Health) (Cochran Veterans Administration Hospital)

Anthony P. Fletcher, B.M., University of London, 1943; B.S., 1943; M.D., 1949.

Samuel B. Gaze, M.D., Washington University, 1945. (See Department of Psychiatry)

George R. Morrison, B.N.S., Holy Cross College, 1946; A.B., University of Rochester, 1948; M.D., 1954. (See Department of Preventive Medicine and Public Health)

Brent M. Parker, M.D., Washington University, 1952.

Charles Ward Parker, M.D., Washington University, 1953.

Horace Mitchell Perry, M.D., Washington University, 1946. (Cochran Veterans Administration Hospital)

John A. Pierce, M.D., University of Arkansas, 1948. (Also Cochran Veterans Administration Hospital)

Research Associate Professors

Norma A. Fletcher, M.S. (Chemical Engineering), The Technical University, Copenhagen, 1949; Ph.D., University of Copenhagen, 1963.

Virginia Minnich, B.S., Ohio State University, 1937; M.S., Iowa State College, 1938.

Associate Professors (Clinical)

Paul O. Hagemann, A.B., Washington University, 1930; M.D., 1934.

Michael M. Karl, B.S., University of Wisconsin, 1936; M.D., University of Louisville, 1938.
Virgil Loeb, Jr., M.D., Washington University, 1944. (See Department of Pathology.)
Cyril M. MacBryde, A.B., Washington University, 1926; M.D., Harvard University, 1930.
Robert Paine, M.D., Harvard University, 1944. (St. Luke's Hospital)
Thomas Joseph Walsh, B.S., University of Richmond, 1946; M.D., Washington University, 1949.

Associate Professors Emeriti (Clinical)
Alfred Goldman, A.B., Washington University, 1916; M.D., 1920; M.S., 1922.
Joseph W. Larimore, A.B., DePauw University, 1908; M.D., Washington University, 1913.
Drew W. Luten, A.B., University of Kentucky, 1901; M.D., Johns Hopkins University, 1911.
William H. Olmsted, B.S., Coe College, 1909; M.D., Johns Hopkins University, 1913.

Assistant Professors
Umit T. Aker, M.D., Istanbul University, 1954.
France Alexander, A.B., Indiana University, 1950; M.D., 1953. (Homer G. Phillips Hospital)
Lamont W. Gaston, A.B., University of Kansas, 1950; M.D., 1953. (Jewish Hospital)
William L. Green (Markle Scholar), A.B., Harvard University, 1950; M.D., 1954. (City Hospital)
John O. Holloszy, M.D., Washington University, 1957. (See Department of Preventive Medicine and Public Health)
Rex L. Jamison A.B., University of Iowa, 1955; B.A. (Animal Physiology), Oxford University, 1957, as Rhodes Scholar; M.D., Harvard University, 1960. (Jewish Hospital)
Manuel E. Kaplan, B.S., University of Arizona, 1950; M.D., Harvard University, 1954. (Jewish Hospital)
Saulo Klahr, M.D., Universidad Nacional de Colombia, 1959.

George Kobayashi (Mycology-Dermatology), B.S., University of California, 1952; Ph.D., Tulane University, 1963. (See Department of Microbiology)
Stuart A. Kornfeld, A.B., Dartmouth College, 1958; M.D., Washington University, 1962. (Faculty Associate, American Cancer Society)
J. Russell Little, Jr., A.B., Cornell University, 1952; M.D., University of Rochester, 1956. (See Department of Microbiology) (Jewish Hospital)
Herbert Lubowitz, A.B., Clark University, 1954; M.D., Washington University, 1958. (On leave of absence from July 1 to August 31, 1968)
Philip W. Majerus, M.D., Washington University, 1961. (See Department of Biological Chemistry) (American College of Physicians Scholar; Faculty Associate, American Cancer Society)
James Edward McGuigan, B.S., Seattle University, 1952; M.D., St. Louis University, 1956.
G. Charles Oliver, A.B., Harvard University, 1953; M.D., 1957.
C. Kirk Osterland, M.D., University of Manitoba, 1956. (See Department of Preventive Medicine and Public Health)
James C. Peden, Jr., A.B., Haverford College, 1951; M.D., Washington University, 1955. (See Department of Preventive Medicine and Public Health)
David L. Rimoin, B.S., McGill University, 1957; M.D., C.M., 1961; M.S., 1961; Ph.D., Johns Hopkins University, 1967.
Alan M. Robson, M.B.B.S., University of Durham Medical School (England), 1959; M.D., 1964. (See Department of Pediatrics)
Arthur Sakamoto, A.B., Ohio University, 1943; M.D., University of Rochester, 1950. (Cochran Veterans Administration Hospital)
Raymond G. Schultz (U.S. Public Health Service Fellow, Renal Diseases), A.B., Washington University, 1955; M.D., 1959.
Eduardo Slatopolsky, M.D., University of Buenos Aires, 1959.
William S. Sly, M.D., St. Louis University, 1957. (Faculty Associate, American Cancer Society)
Eng M. Tan, A.B., Johns Hopkins University, 1952; M.D., 1956. (See Department of Preventive Medicine and Public Health) (On leave of absence)
John D. Vavra, B.A., University of Colorado, 1950; M.D., Washington University, 1954. (See Department of Preventive Medicine and Public Health)
R. Dean Wochner, A.B., Arizona State College, 1956; M.D., Washington University, 1960. (City Hospital)

**Research Assistant Professor**
Mabel L. Purkerson, A.B., Erskine College, 1951; M.D., Medical College of South Carolina, 1956. (See Department of Pediatrics)

**Research Assistant Professor Emeritus**
Ann Reubenia Dubach, A.B., Bryn Mawr College, 1919; M.S., University of Colorado, 1933; Ph.D., 1938.

**Assistant Professors (Clinical)**
Grace E. Bergner, A.B., Washington University, 1939; M.D., 1943.
John W. Berry, B.S., University of Toledo, 1943; M.D., St. Louis University, 1946.
Francis Joseph Catanzaro, M.D., Washington University, 1948.
Adolph H. Conrad, Jr. (Dermatology), A.B., Washington University, 1934; M.D., 1938.
Truman Guthred Drake, A.B., Washington University, 1929; M.D., 1933.
Charles W. Duden, M.D., Washington University, 1926.
Joseph C. Edwards, A.B., University of Oklahoma, 1930; M.D., Harvard University, 1934.
Bernard Friedman, A.B., University of Wisconsin, 1931; M.D., 1934.
Ralph V. Gieselman, M.D., Washington University, 1947.

Melvin Leonard Goldman, A.B., Washington University, 1939; M.D., 1943.
Neville Grant, A.B., Yale University, 1950; M.D., Columbia University, 1954.
Lawrence K. Halpern (Dermatology), M.D., University of Colorado, 1937.
Stanley Forrest Hampton, A.B., Washington and Lee University, 1930; M.D., Washington University, 1934.
James H. Hutchinson, Jr., B.S., Arkansas A. and M. College, 1942; M.D., University of Arkansas, 1945.
Robert C. Kingsland, A.B., Washington University, 1933; M.D., 1937.
Norman P. Knowlton, Jr., B.S., Harvard University, 1942; M.D., 1945.
Marvin Levin, A.B., Washington University, 1947; M.D., 1951. (See Department of Preventive Medicine and Public Health)
Morris D. Marcus (Dermatology), M.D., Washington University, 1934.
Morris Moore (Mycology) (Dermatology), S.B., Boston University, 1928; A.M., Harvard University, 1929; Ph.D., Washington University, 1933.
J. Roger Nelson, A.B., Washington University, 1949; M.D., 1953. (See Department of Otolaryngology)
James F. Nickel, A.B., University of Oklahoma, 1944; M.D., Washington University, 1948.
Joseph W. Noah, A.B., University of Missouri, 1938; B.S. in Medicine, 1939; M.D., Washington University, 1941.
William David Perry, A.B., Northwest Missouri State College, 1943; B.S. in Medicine, University of Missouri, 1945; M.D., Washington University, 1947.
Harold K. Roberts, B.A., Ohio State University, 1935; M.D., 1939.
Marvin Rosecan, B.S., Washington University, 1949; M.D., 1949.
Ernest T. Rouse, B.S., Alabama Polytechnic Institute, 1939; M.D., Washington University 1943.
Llewellyn Sale, Jr., A.B., Yale University, 1936; M.D., Washington University, 1940.
Burton A. Shatz, A.B., Washington University, 1940; M.D., 1943.
James C. Sisk (Dermatology), A.B., Washington University, 1943; M.D., 1946.
Franz U. Steinberg, M.D., University of Berne, 1938. (See Department of Preventive Medicine and Public Health) (Jewish Hospital)
Barrett L. Taussig, A.B., Harvard University, 1928; M.D., Washington University, 1932.
Ray David Williams, A.B., Hampden-Sydney College, 1930; M.S., Emory University, 1931; M.D., Washington University, 1937.
Keith S. Wilson, A.B., Williams College, 1930; M.D., Washington University, 1934.

Assistant Professors Emeriti (Clinical)
Charles H. Eyermann, M.D., St. Louis University, 1911.
Samuel B. Grant, B.S., Washington University, 1918; M.D., 1920.
Arthur E. Strauss, B.S., Harvard University, 1912; M.D., 1917.
Lawrence D. Thompson, B.S., Rutgers University, 1917; M.D., Cornell University, 1922.

Instructors
Greta Camel, A.B., University of Wisconsin, 1946; M.D., 1949.
Michael Gass, B.S., Elmhurst College, 1954; M.D., Washington University, 1958. (Also School of Dentistry)
Leonard Jarett (Markle Scholar), B.A., Rice University, 1958; M.D., Washington University, 1962. (See Department of Pathology)
Leonard N. Newmark, A.B., Washington University, 1936; M.A., 1939; M.D., 1963. (Jewish Hospital)
Glenn T. Peake, B.A., University of Kansas, 1939; M.D., 1963. (See Department of Pediatrics)
Vincent J. Proskey, B.S., University of Detroit, 1954; M.D., Marquette University, 1964. (City Hospital)
Reginald P. Pugh, B.A., University of Michigan, 1953; M.D., 1955. (Ellis Fischel State Cancer Hospital)
Sorrel S. Resnik (Dermatology), B.A., University of Buffalo, 1957; M.D., Vanderbilt University, 1961.
Peter N. Walsh, B.A., Amherst College, 1957; M.D., Washington University, 1961. (On leave of absence)
Marlys Witte (Established Investigator of the American Heart Association), B.A., Barnard College, 1955; M.D., New York University, 1960. (See Department of Surgery)

Research Instructors
John James Jeffrey, Jr., (Biochemistry-Dermatology) B.S., College of the Holy Cross, 1958; Ph.D., Georgetown University, 1963.
Irene E. Karl, B.S., University of Wisconsin, 1937; M.D., 1938; Ph.D., 1940.
Teofil Kheim (Gerontology), M.D., University of Budapest, 1934. (See Division of Gerontology)
Ann Marie Skinner, A.B., Harris Teachers College, 1931; M.A., St. Louis University, 1936.
Richard J. Warren, A.B., University of Oklahoma, 1958; Ph.D., St. Louis University, 1967.
Ee Thye Yin, Inter.B.Sc., University of London, 1954. (Jewish Hospital)
Aniece A. Yunice, B.A., American University of Beirut, 1948; M.S., Wayne State University, 1958. (Cochran Veterans Administration Hospital)

Instructors (Clinical)
Harry Agress, B.S., Washington University, 1932; M.D., 1932.
Louis F. Atten, B.S., University of Illinois, 1923; M.D., Washington University, 1927.
Morris Alex, B.S., University of Missouri, 1942; M.D., Washington University, 1943.
James W. Bagby (Dermatology), A.B., University of Missouri, 1930; B.S., in Medicine, 1931; M.D., Washington University, 1933.
Jack Barrow, M.D., Washington University, 1946.
Walter M. Baumgarten, Jr., A.B., Washington University, 1935; M.D., 1939.
Sim F. Beam, A.B., University of Missouri, 1928; M.D., Washington University, 1932.
Morton A. Binder, M.D., Yale University, 1948; M.D., Columbia University, 1951.
Aaron Birenbaum, M.D., Washington University, 1948.
Benjamin A. Borowsky, M.D., Washington University, 1958.
Edward W. Cannady, A.B., Washington University, 1927; M.D., 1931.
John M. Cary, A.B., Central College, 1954; M.D., St. Louis University, 1958.
Cecil Marvin Charles, A.B., University of Kentucky, 1926; A.M., 1927; Ph.D., Washington University, 1929; M.D., 1933. (See Department of Anatomy)
Margaret Chieffi, M.D., University of New Zealand, 1937.
Phillip Comens, B.S., in Medicine, University of Missouri, 1949; M.D., Washington University, 1951.
Ralph Cott, Jr., A.B., Washington University, 1948; M.D., 1952.
Duane E. Cozart, Ph.B., University of Chicago, 1947; A.B., Washington University, 1949; M.D., Medical College of Virginia, 1959.
Arnold Dankner, M.D., Washington University, 1947.
John D. Davidson, A.B., Washington University, 1948; M.D., 1952.
Bernard DeHovitz, M.D., Louisiana State University, 1948.
Norman Walter Drey, A.B., Princeton University, 1932; M.D., Washington University, 1936.
Calvin C. Ellis (Dermatology), A.B., Washington University, 1937; M.D., 1941.
Julius Elson, M.D., Washington University, 1928.
Mauri Feldaker (Dermatology), A.B., Washington University, 1949; M.D., 1950.
Donald H. Figure, A.B., Washington University, 1949; M.D., 1950.
Alfred Fleishman, B.S., Washington University, 1935; M.D., 1935.
Bruce Todd Forsyth, M.D., Washington University, 1947.
Arthur H. Gale, B.S., Washington University, 1955; M.D., University of Missouri, 1959.
Kenneth Gentsch, A.B., Princeton University, 1954; M.D., Washington University, 1958. (On leave of absence)
Bertrand Y. Glassberg, B.S., Washington University, 1923; M.D., 1925.
John M. Grant, A.B., Harvard University, 1950; M.D., Washington University, 1954.
Axel R. Gronau, M.D., University of Naples, 1935.
William K. Hall (Dermatology), B.S., Yale University, 1939; M.D., Harvard University, 1942.
Mack J. Halloran, M.D., Marquette University, 1959.
Lee B. Harrison, A.B., University of Utah, 1925; M.D., Washington University, 1927.
Richard F. Huck, B.S., Notre Dame University, 1947; M.D., Washington University, 1948.
Bernard Hulbert, B.A., University of Wisconsin, 1938; M.D., 1941.
Warren Z. Jacobson, M.D., St. Louis University, 1959. (On leave of absence)
David N. Kerr, A.B., University of Colorado, 1936; M.D., Washington University, 1941.
Charles Kilo, M.D., Washington University, 1953; M.D., 1959.
Melvin B. Kirstein, B.S., Indiana University, 1930; M.D., 1933.
Robert E. Koch, A.B., Washington University, 1936; M.D., 1940.
Phillip E. Korenblat, M.D., University of Arkansas, 1960.
Daniel K. Lane (Dermatology), B.A., Princeton University, 1955; M.D., Washington University, 1959.
David M. Lieberman, M.D., Vanderbilt University, 1949.
(See Department of Radiology)
Warren M. Lonergan, A.B., Westminster College, 1956; M.D., Vanderbilt University, 1940.
Carl A. Lyss, A.B., Washington University, 1932; B.S., 1932; M.D., 1936.
Richard W. Maxwell, A.B., Greenville College, 1932; M.D., University of Chicago, 1937.
Oliver A. McKee (Dermatology), L.R.C.P., Royal College of Physicians and Surgeons (Dublin), 1949; S.M., 1949.
Austin F. Montgomery, M.D., University of Pittsburgh, 1954.

Gordon Newton, M.D., University of Arkansas, 1958.
Lamar H. Ochs, A.B., Washington University, 1941; M.D., 1944.
N. Norman Orgel, B.S., College of City of New York, 1929; M.A., Harvard University, 1930; M.D., Washington University, 1934.
Robert F. Owen, B.A., Princeton University, 1948; M.D., Yale University, 1952.
Kenneth C. Price, M.D., University of Washington, 1951.
Samuel E. Schechter, M.D., Washington University, 1941.
John Wickham Seddon, Ph.B., Yale University, 1931; M.D., Washington University, 1935.
John Blasdel Shapleigh II, M.D., Washington University, 1946.
John Spaulding Skinner, M.D., Washington University, 1940.
Ross B. Sommer, A.B., Miami University, 1949; M.D., Cornell University, 1949.
J. Allen Thiel, B.S., Rockhurst College, 1956; M.D., St. Louis University, 1960.
Stanley M. Wald, M.D., Washington University, 1946.
Hugh R. Waters, B.S., Northwestern University, 1942; M.D., Washington University, 1945.
Alvin S. Wenneker, A.B., Washington University, 1949; M.D., 1953.
Herbert C. Wiegand, A.B., Washington University, 1940; M.D., 1943.
Herbert B. Zimmerman, M.D., Washington University, 1951.

Instructors Emeriti (Clinical)
William G. Becke, M.D., Washington University, 1923.
Anthony B. Day, B.S., Harvard University, 1913; M.D., Washington University, 1919.
Martin F. Engman, Jr. (Dermatology), M.D., Washington University, 1928.
J. Ted Jean, A.B., Indiana University, 1924; M.D., Washington University, 1928.
David Miller Skilling, Jr., B.S., Washington and Jefferson College, 1923; M.D., Washington University, 1928.
Harry W. Wiese, B.S., Washington University, 1920; M.D., 1922.

Research Assistants
Margaret Williams Erlanger, B.A., University of Iowa, 1932; M.S., 1938. (Cochran Veterans Administration Hospital)
Mary Chapman Johnson, A.B., Washington University, 1938.
Sook Won Lee, B.S., Seoul National University (Korea), 1957; M.S., George Peabody College, 1962. (Jewish Hospital)
Ida Kozak Mariz, A.B., Washington University, 1940.
Doris Thompson, B.S., Mississippi State University, 1942.

Assistants (Clinical)
John E. Mullins, M.D., Washington University, 1958.
John S. Schoentag (Dermatology), A.B., University of Missouri, 1956; M.D., Washington University, 1960.

Teaching by the Department of Medicine in the second year is designed to (a) prepare the student for the transition from the preclinical sciences to the study of the sick patient at the bedside; (b) help him analyze the manifestations of disease in terms of the altered mechanisms responsible for these changes; and (c) introduce him to those special techniques of examination which will be used constantly with the beginning of junior clerkships. This instruction will at times be undertaken jointly with members of other clinical departments, and will be co-ordinated when practicable with subject matter presented by the Department of Pathology.

First Year

Topics in Clinical Medicine. This is an interdepartmental course designed to stimulate student interest in clinical medicine through carefully selected and presented discussions of both the clinical and basic science features of a number of illnesses. The course director will involve faculty from the several clinical departments in structuring the direction, content, and presentation of the subject. (Dr. Kipnis and Staff)
SECOND YEAR

(a) Pathophysiology. Selected topics in clinical medicine are discussed in detail to illustrate the application of biochemical, physiological, and anatomical information in the understanding of pathological states. Infectious, cardiovascular and renal, neurological, gastrointestinal, hematological, metabolic, nutritional, and developmental diseases are reviewed by an interdepartmental faculty. Emphasis is placed on the use of fundamental information in approaching clinical problems as a way of thinking in preparation for a lifetime of medicine, during which much new information will constantly be acquired. (Drs. Bricker, Hartford, Landau, and Peterson)

(b) Clinical Diagnosis. Lectures, demonstrations, and practical exercises in the technique of clinical diagnosis. (Drs. Garfinkel, Smith, and Staff)

(c) Laboratory Methods of Diagnosis. Lectures and laboratory course in microscopic, bacteriological, serological, and chemical methods of diagnosis. (Dr. E. B. Brown and Staff)

THIRD YEAR

General Medicine. Supervised Study of Patients on the Semi-Private Medical Service of the Barnes Hospital and the Jewish Hospital, and on the Wards of St. Louis City Hospital and the Veterans Administration Hospital. Students are assigned in rotation as clinical clerks to the patients admitted to these services. Teaching exercises include ward rounds, clinics, and afternoon work in the wards and laboratories. Students serve for six weeks on each of the two services. (Drs. Reinhard, Perkoff, M. Perry, Wessler, and Staff)

(a) Medical Clinics. Cases which have been studied by students working in the wards of Barnes Hospital are presented before the third- and fourth-year classes to illustrate medical problems of particular interest. (Dr. C. Moore and Staff)

(b) Clinical Pathological Conferences. Abstracts of the clinical records of patients upon whom post-mortem examinations have been performed are presented in advance to members of the third- and fourth-year classes and to members of the medical staff. At each conference the diagnosis is discussed in detail by the clinical staff before the anatomical findings are presented by the pathologists. (Dr. Reinhard and Medical Staff, Pathology Staff)

FOURTH-YEAR ELECTIVES

Clinical Clerkship, Medical Wards of Barnes Hospital. Six weeks, entire day. Patients are assigned for complete study and are followed throughout their stay in the hospital. Cases are presented by the students before house officers and the attending physician at ward rounds three times a week. Special therapeutic conferences are held two times a week with the Medical Resident. Students also attend weekly staff rounds, specialty conferences, Saturday Noon Clinic, and clinicopathologic conferences. (Drs. C. Moore, Daughaday, and Staff)
**Medicine and Pediatrics Outpatient Clinic Clerkship.** Twelve weeks, all day. Approximately two-thirds time in general medicine and medical specialty clinics, one-third time in the pediatrics and the pediatrics specialty clinics. Students will work up new patients under the supervision of the staff, and will be encouraged to assume a high degree of responsibility for their patients. They will be expected to participate in the conferences and rounds associated with the specialty clinics. The clerkship will be integrated by weekly seminars conducted by the Department of Preventive Medicine.

(Drs. Vavra, D. Jones, and Staff)

**Cardiovascular Disease**

(a) Electrocardiography, elementary vectorcardiography.

(Drs. Parker, Aker, Hellam, Oliver)

(b) Clinical Cardiology, St. Luke's Hospital, six weeks, all day. Students will be assigned to intensive care service, the heart station, and the Radiology Department.

(Dr. Paine)

(c) Clinical Cardiopulmonary Physiology, Jewish Hospital, six weeks, all day. Experience in heart station, coronary care unit, pulmonary station, and catheter laboratory.

(Dr. Zimmerman)

(d) The Lymphovascular System

(Dr. Witte and Staff)

(e) Research (minimum of twelve weeks, all day).

1. Myocardial contraction, experimental pharmacology, cellular physiology.

   (Dr. J. Smith)

2. Muscle contraction and electrophysiology.

   (Dr. Hellam)

3. Experimental hemodynamics.

   (Dr. Aker)

4. Experimental pharmacology of the heart: measurement of blood and tissue levels of digitalis.

   (Dr. Oliver)

5. Experimental thrombosis.

   (Dr. Wessler)

6. Pathogenic mechanisms of hypertension.

   (Drs. Perry, Sakamoto)

7. Lymph system.

   (Dr. Witte)

**Dermatology**

(a) Clinical Clerkship. Students will participate in both inpatient and outpatient care. Stress will be placed on the dermatologic variations normally encountered, identification of common skin diseases, dermatologic clues to systemic disease, etc. Instruction will be given in cutaneous histopathology and clinical mycology. (Dr. Eisen and Staff)

(b) Research (minimum of twelve weeks, all day).

1. Biochemistry of connective tissue.

   (Dr. Eisen)

2. Studies of *Histoplasma capsulatum* and other mycotic agents. (Dr. Kobayashi)
Jewish Hospital Student Internship

(a) Private Medical Service, six weeks, all day. Assignments and responsibilities comparable to those of interns. Students will attend the medical teaching conferences at the Jewish Hospital, as well as Grand Rounds, C.P.C., and Noon Clinics at Barnes Hospital. (Dr. Wessler and Staff)

(b) Intensive Care Unit, after completion of above. Varied experience in the care and management of acute and critical medical catastrophes. (Dr. Wessler and Staff)

Student Internships. Unit I Service at St. Louis City Hospital and St. Luke's Hospital. Students will be assigned responsibilities similar to those of an intern and will participate in all teaching conferences. (Drs. Perkoff and Paine)

Saturday Noon Clinic. Medical problems of particular interest. (Dr. C. Moore and Staff)

Clinical Pathological Conferences. Thursdays, 12-1 p.m., September to June. (Dr. Reinhard and Medical Staff, Pathology Staff)

Conjoint Interdepartmental Seminar: Membrane Physiology and Cellular Transport Systems. (Co-ordinators: Drs. Peterson and Jarett)

Arthritis and Rheumatic Diseases. (See Department of Preventive Medicine.)

Gastroenterology

(a) Clinical gastroenterology. Six weeks, all day. Students will participate in the study of patients on whom consultations have been requested, will receive instruction in specialized diagnostic technics, and will participate in the conferences and clinics run by the Division. (Drs. Peterson, Aach, McGuigan)

(b) Research (minimum of twelve weeks, all day).

1. Bile salt metabolism. (Dr. Peterson)
2. Disaccharidase deficiency. (Dr. Peterson)
3. Hepatic synthesis of "early labeled" bilirubin, excretory function in the isolated rat liver. (Dr. Aach)
4. Antibody production to gastrointestinal hormones and studies of immunologic phenomena in gastrointestinal diseases. (Dr. McGuigan)

Genetics

(a) Clinical research. Twelve weeks, all day. Instruction in clinical recognition, laboratory screening for inborn errors of metabolism, genetic counseling. (Dr. Rimoin)

(b) Laboratory experience in genetic regulation of temperate bacteriophage, use of fibroblast culture technic, or cytogenetic studies. (Dr. Sly)
Hematology

(a) Clinical hematology. Six weeks, all day. Students receive intensive instruction in morphology, specialized diagnostic technics, management of patients with hematologic disorders. (Dr. E. B. Brown and Staff)

(b) Clinical blood coagulation. Six weeks, all day. Students learn to perform the tests of blood coagulation and then participate in the evaluation of patients with bleeding disorders. (Dr. Gaston)

(c) Immunohematology. Eighteen weeks, all day. Study of blood group antibodies, their isolation, characterization, and immunochemical properties. (Dr. Kaplan)

(d) Research (minimum twelve weeks, all day).
1. Normal and deranged iron metabolism. (Dr. E. Brown)
2. Clinical and biochemical studies of patients with suspected defects in erythrocyte energy metabolism. (Dr. Vavra)
3. Lipid metabolism in platelets. (Dr. Majerus)
4. Biochemical studies of the process of transformation in malignancy. (Dr. Majerus)
5. Biochemical studies of erythrocytes and glycoproteins of hematologic interest. (Dr. Kornfeld)
6. Sugar nucleotide metabolism and its control in white blood cells and platelets. (Dr. Kornfeld)
7. Coagulation and fibrinolysis. (Dr. Bachman)

Immunology-Research. Minimum twelve weeks, all day.

(a) Research immunology. (Dr. C. Parker)

(b) Antibody structure, binding reaction of antibodies, or antibody biosynthesis. (Dr. Little)

(c) Plasma protein metabolism and immunology. (Dr. Wochner)

Infectious Disease

(a) Problems of Infectious Diseases. Eighteen weeks, Thursdays, 3-4 p.m. Conducted as a seminar. Limit eleven students. (Drs. Harford, Herweg, King, Kobayashi, Little, McGavran, Middelkamp)

(b) Clinical infectious disease and bacteriology. Jewish Hospital, six weeks, all day. (Drs. Little and Sonnenwirth)

(c) Clinical infectious disease. Barnes Hospital, six weeks, all day. (Dr. Harford)
Metabolism and Endocrinology

(a) Seminar: Endocrine physiology and the biochemical aspects of hormone action. Twelve weeks, once a year. (Drs. Daughaday, Kipnis, Avioli, Eisenstein, Utiger)

(b) Clinical clerkship, endocrine patients at Barnes, Jewish, and Children’s Hospitals. Six weeks, all day. (Dr. Daughaday and Staff)

(c) Research. Minimum of twelve weeks, all day.
   1. Pituitary physiology; immunoassays. (Dr. Daughaday)
   2. Experimental diabetes (18 weeks). (Dr. Kipnis)
   3. Thyroid and pituitary physiology. (Dr. Utiger)
   4. Thyroid diseases and thyroid physiology. (Dr. Green)
   5. Calcium metabolism. (Dr. Avioli)

Pulmonary Disease and Function. Six weeks, all day, but may be extended to longer period if student wishes to participate in research. Instruction in the evaluation of pulmonary function and in the management of pulmonary disease. (Dr. Pierce)

Renal Disease

(a) Clinical nephrology. Six weeks, all day. Study of patients with renal disease and electrolyte disorders. (Drs. Bricker, Klahr, Slatopolsky, Lubowitz, and Schultze)

(b) Mixed clinical and research elective in renal disorders and transport. Eighteen weeks, all day. Research activities can be selected in general renal physiopathology, micropuncture technics, or transport. Limit three students. (Dr. Bricker and Staff)

(c) Renal and electrolyte disorders. Jewish Hospital, six weeks, all day. (Dr. Jamison)

(d) Micropuncture studies of transport systems in the renal medulla. Twelve weeks, all day. (Dr. Jamison)
Dr. Herman N. Eisen conducts an antibody titration experiment with members of his department.

DEPARTMENT OF MICROBIOLOGY

Professor and Head of Department
Herman N. Eisen, A.B., New York University, 1939; M.D., 1943.

Associate Professors
Milton Schlesinger, B.S., Yale University, 1951; M.S., University of Rochester, 1953; Ph.D., University of Michigan, 1959.

Associate Professor Emeritus
Hiromu Tsuchiya (Parasitology), A.B., University of Missouri, 1913; Sc.D., Johns Hopkins University, 1930.

Assistant Professors
David Apirion, M.S., Hebrew University of Jerusalem, 1960; Ph.D., University of Glasgow, 1963.
Julian B. Fleischman, B.S., Yale University, 1955; Ph.D., Harvard University, 1960. (See Department of Preventive Medicine and Public Health)
David E. Kennell, A.B., University of California, 1955; Ph.D., 1959.
J. Russell Little, Jr., A.B., Cornell University, 1952; M.D., University of Rochester, 1956. (See Department of Medicine) (Jewish Hospital)
SECOND YEAR

Microbiology. Lectures and laboratory. This course will present the basic principles relating to the metabolism, growth, and reproduction of bacteria and viruses and to the immune responses of the host to pathogenic microbes and their metabolic products. The organization of the course is as follows: pure culture methodology, biochemical mechanisms of nutrition and intermediary metabolism, physiology of growth, fundamental genetics (with special emphasis on microbial aspects), immunology. In terms of the above concepts, specific groups of pathogenic organisms and viruses will then be considered. The interaction between host and parasite will be studied by analyzing the biochemical basis for the pathogenicity of the microbe and for the immune reaction of man. The factors which make micro-organisms vulnerable or resistant to chemotherapeutic agents will also be examined.

FOURTH YEAR

Seminar Electives

At present the primary enrollees in these courses are students working for a Ph.D. degree in one of the basic sciences. However, these courses are recommended for interested medical students, especially those who may be considering a career in medical research. Emphasis is placed on the organization and function of living systems at the molecular level. The courses combine formal lectures with student-directed seminars. In the latter, each student will have an opportunity to integrate various disciplines of modern molecular biology into the area of biology or medicine that is of particular interest to him. Representative courses are as follows:

Microbial Physiology (Fall, 1968). The regulation of microbial growth and metabolism. Some of the topics to be covered are biosynthesis of proteins and nucleic acids in bacteria and in virus-infected bacteria, control of enzymatic activity, spore formation and germination, and permeability properties of micro-organisms.

(Drs. M. Schlesinger and S. Schlesinger)
Molecular Biology of Bacterial Viruses (Spring, 1969). Molecular structure of bacterial viruses. Metabolism of the infected cell, with emphasis on the genetics of host and viral controlled functions. Types of relationships of a virus to the infected cell, e.g., lysogeny, immunity, virulence. Emphasis will be on the bacterial viruses, especially \( \lambda \), \( \Phi X174 \), and T-even bacteriophages. However, where appropriate, comparisons will be made with animal viruses. (Drs. Eigner and Kennell)

Microbial Genetics and Protein Synthesis. The genetics and molecular biology of translation of messenger RNA or ribosomes; suppressor mutations; episomes and extrachromosomal inheritance. (Drs. Apirion and D. Schlessinger)

Antibodies. The structure, function, evolutionary development, and biosynthesis of diverse forms of antibody molecules. (Drs. Eisen, Fleischman, Little)

FULL-TIME ELECTIVES

The purpose of these electives is to acquaint the student with the kinds of analyses that are used in present-day biomedical research, especially at the molecular level. Although the subject matter is mostly restricted to microbial systems or to the immune response, the experience should provide useful training for later research in any area of modern biological or clinical research. (Staff)

Topics to be offered include:

Genetic and biochemical analyses of normal and mutated ribosomes from \( E. coli \) strains. Ribosomes as a model for the genetic control and biosynthesis of a cellular organelle. (Dr. Apirion)

Role of nucleases, especially DNases, in bacterial metabolism and their mechanism of action. Host-induced modification and restrictions of bacteriophage. (Dr. Eigner)

Biologic activity and structure of myeloma proteins and antibodies. (Dr. Eisen)

Structure and biosynthesis of immunoglobulin polypeptide chains using methods and techniques of protein chemistry and isotope labeling. (Dr. Fleischman)

The regulation of nucleic acid and protein metabolism in virus-infected bacteria. The response of bacteria to starvation. (Dr. Kennell)

The control of cellular differentiation of the medically important systemic fungi, in particular, \( Histoplasma capsulatum \). (Dr. Kobayashi)

Immunoochemical techniques. Biosynthesis of antibodies and their binding reactions. (Dr. Little)
Comparative studies of alkaline phosphatase from different micro-organisms: Protein chemistry, metal binding sites in bacterial envelopes, molecular hybrids of enzymes from different organisms. (Dr. M. Schlesinger)

The effect of amino acid analogues on the structure and function of proteins. The role of transfer RNA in the regulation of enzyme synthesis. (Dr. S. Schlesinger)

The metabolism of protein, ribosomes, and polyribosomes in growing and nongrowing bacteria. Mechanisms of action of antibiotics. (Dr. D. Schlessinger)

Performance and interpretation of diagnostic and serologic bacterial tests, as well as consultations with patients who have infectious diseases. Integration of the clinical and laboratory findings. (Drs. Sonnenwirth and Little)
DEPARTMENT OF NEUROLOGY

Neurology concerns itself with the diseases of brain, spinal cord, and peripheral nerves. Instruction is provided in all years, commencing in the first year with a series of case demonstrations designed to acquaint the freshman student with the applicability of anatomical and physiological knowledge of the nervous system to the localization and pathogenesis of neurological signs and symptoms. In the second year the Department contributes to a course in pathophysiology of nervous system disorders. In addition there are lectures and exercises with patients in neurological physical diagnosis, and a sequence of lectures in neurological medicine. Third-year activities are based in an inpatient and outpatient clerkship. In the fourth year there are opportunities for clinical externship and for investigation of nervous system functioning in every aspect.
Professor and Head of Department
James Lee O'Leary, B.S., University of Chicago, 1925; Ph.D., 1928; M.D., 1931.

Professors
Philip R. Dodge, M.D., University of Rochester, 1948. (Also Professor and Head of Pediatrics)
Sven G. Eliasson, Ph.D., University of Lund, 1952; M.D., 1954.

Professor Emeritus and Lecturer
George Holman Bishop (Neurophysiology), A.B., University of Michigan, 1912; Ph.D., University of Wisconsin, 1920.

Associate Professor Emeritus
Ethel Ronzoni Bishop (Biochemistry), B.S., Mills College, 1913; A.M., Columbia University, 1914; Ph.D., University of Wisconsin, 1922.

Associate Professors (Clinical)
Irwin Levy, A.B., Cornell University, 1927; M.D., St. Louis University, 1931; D.M.S., Columbia University, 1935.

Associate Professor Emeritus (Clinical)
Andrew B. Jones, M.D., Vanderbilt University, 1916.

Assistant Professors
Lawrence A. Cohen, B.S., Western Reserve University, 1948; M.D., 1954; M.A., Northwestern University, 1951.
William B. Hardin, B.A., Rice University, 1953; M.D., University of Texas, 1957.
Arthur L. Prensky, A.B., Cornell University, 1951; M.D., New York University, 1955. (See Department of Pediatrics)

Research Assistant Professor
Margaret H. Clare (Neurophysiology), B.S.Ed., Southeast Missouri State Teachers College, 1941; M.A., Washington University, 1951.

Assistant Professors (Clinical)
Andrew J. Gay, B.S., University of Alabama, 1950; M.A., 1954; M.D., Medical College of Alabama, 1955. (See Department of Ophthalmology)
Joseph J. Gitt, M.D., Washington University, 1930.

Assistant Professor Emeritus (Clinical)
Archie D. Carr, B.S., Washington University, 1918; M.D., 1921.

Instructors
Robert L. Chesnow, B.S., Union College, 1955; M.D., Albany Medical College, 1960. (City Hospital)
Warren A. Weinberg, B.A., Vanderbilt University, 1956; M.D., 1959. (See Department of Pediatrics)

Instructors (Clinical)
Joseph M. Dooley, Jr., M.D., St. Louis University, 1958. (See Department of Preventive Medicine and Public Health)
Robert J. Mueller, M.D., Washington University, 1936; M.S., University of Michigan, 1942.
Earl R. Schultz, A.B., Southeast Missouri State College, 1952; B.S. in Medicine, University of Missouri, 1953; M.D., Washington University, 1955. (See Department of Psychiatry)

Research Assistant
Jeanne M. Smith.
FIRST YEAR

*Integrative Neurology* (given as part of the Neuroanatomy and Neurophysiology sequence). A series of four clinics is held in the second semester to acquaint students of neuroanatomy and neurophysiology with the applicability of these subjects in localizing lesions of the central and peripheral nervous system. The series commences with spinal and cranial nerve lesions and proceeds systematically through spinal cord, brain stem, basal ganglia, cerebellum and cerebral cortex, utilizing currently available cases from the neurological and neurosurgical services. (Dr. O'Leary and Staff)

SECOND YEAR

*Neurological Examination in Clinical Diagnosis* (part of Physical Diagnosis course). Lectures, demonstrations, and practice examinations of neurological patients under supervision. (Drs. Landau, Klinkerfuss, Eliasson, and Staff)

*Pathophysiology of Nervous System Disorders* (part of course in Pathophysiology). A collaborative sequence with other clinical and basic science departments concerned with diseases of the nervous system. Lectures and seminar-symposia. (Drs. Landau, Eliasson, Hardin, Brooks, and Staff)

*Clinical Neurology.* Eighteen lectures and clinical demonstrations concerning major problems in neurological medicine. (Drs. Hardin, Brooks, and Staff)

THIRD YEAR

*Neurology.* A full-time, three-week clerkship is provided on the ward and private services at Barnes Hospital. Patients are assigned to students, who follow them with the resident staff and discuss them regularly in conferences with the senior staff. Students also work in the Neurology Clinic under staff supervision. (Dr. O'Leary and Staff)

FOURTH YEAR

*Clinical Neurology.* A six-week elective neurology is offered at St. Louis City Hospital. There the student works as a full-fledged member of the clinical team, including responsibility for patients. Formal teaching conferences are provided in addition to regular teaching rounds. (Drs. Chesanow, Dooley, and Staff)

ELECTIVES

*Neurological Research.* A twelve-week elective is available in several areas: electron microscopy of the nervous system, clinical experimental neurophysiology, neurochemistry, and other possible areas. (Dr. O'Leary and Staff)
Research in Neurology. Facilities are available for qualified students in any year to undertake original research in the laboratories of the department or in the clinics or wards.

(Drs. O’Leary, Landau, Eliasson, and Staff)

Staff Conferences. Students are invited to attend the weekly Neuropathology, Neurology, Neurosurgery Conference, held on Wednesday afternoons in Clopton Auditorium. (On the fourth Wednesday of the month it will be held at City Hospital.)
Doctors Willard Allen, Arpad Csapo, and Martti Pulkkine discuss research being conducted by staff members of the Department.

DEPARTMENT OF OBSTETRICS AND GYNECOLOGY

For convenience of administration, care of patients, and teaching and research, the Department of Obstetrics and Gynecology includes the following specialty divisions:

- Gynecological Endocrinology .................................................. Dr. Woolf
- Gynecological Oncology ......................................................... Dr. Camel
- Research (Myometrial Physiology) .......................................... Dr. Csapo
- Research (Biochemistry) ........................................................ Dr. Wiest
- Ob.-Gyn. Service at Max Starkloff Hospital ................................ Dr. Esslinger
- Ob.-Gyn. Service at Homer G. Phillips Hospital .......................... Dr. Monat

Students are given practical instruction in obstetrics and gynecology at St. Louis Maternity Hospital, Barnes Hospital, the Washington University Clinics, and also at St. Louis
City and Homer G. Phillips Hospitals. There are approximately 6,000 confinements annually which are available for the teaching of obstetrics on the ward services of St. Louis Maternity, St. Louis City, and Homer G. Phillips Hospitals. Instruction in the care of ambulatory obstetrical and gynecological patients is carried out in the University Clinics, where about 1,000 new patients are seen and about 15,000 follow-up visits are made annually. Instruction in gynecology is given in the University Clinics and on the wards of the St. Louis Maternity, Barnes, and Barnard Hospitals. There are approximately 2,500 admissions annually to the gynecological service, of which about one-fifth have malignant disease.

Professor and Head of the Department
Willard Myron Allen, B.S., Hobart College, 1926; M.S., University of Rochester, 1929; M.D., 1932; Sc.D. (hon.), 1957; Sc.D. (hon.) Hobart College, 1940.

Professors
Arpad I. Csapo, M.D., University of Szeged (Hungary), 1941.
Walter G. Wiest (Biochemistry), A.B., Brigham Young University, 1948; Ph.D., University of Wisconsin, 1952. (See Department of Biological Chemistry)

Professors (Clinical)
A. Norman Arneson, B.S., Texas Christian University, 1924; M.D., Washington University, 1928. (See Department of Radiology)
John E. Hobbs, A.B., Southwest Missouri State Teachers College, 1923; M.D., Washington University, 1927.
Samuel D. Soule, M.D., Washington University, 1928.

Professors Emeriti (Clinical)
Melvin A. Roblee, B.S., Washington University, 1923; M.D., 1925.
Grandison D. Royston, M.D., Washington University, 1907.

Associate Professor
Ralph B. Woolf, B.S., Massachusetts Institute of Technology, 1935; M.D., University of Rochester, 1939.

Associate Professor (Clinical)
William H. Masters, B.S., Hamilton College, 1938; M.D., University of Rochester, 1943.

Associate Professor Emeritus (Clinical)
F. P. McNalley, B.S., Washington University, 1915; M.D., 1917.

Assistant Professors
H. Marvin Camel, M.D., Creighton University, 1950.
Ernest R. Friedrich, M.D., University of Heidelberg, 1954.

Assistant Professors (Clinical)
Arthur T. Esslinger, M.D., Washington University, 1940.
Charles R. Gulick, A.B., Central College, 1940; M.D., St. Louis University, 1943.
Herman Hutto, A.B., University of Alabama, 1932; M.D., Washington University, 1935.
Frank B. Long, Jr., M.D., Washington University, 1947.
Laurence E. Maze, M.D., Washington University, 1948.
James Pennoyer, B.S., Hobart College, 1933; M.D., University of Rochester, 1939.
David Rothman, B.S., Washington University, 1935; M.D., 1935.
Willard C. Scrivner, B.S., Washington University, 1926; M.D., 1930.
William L. Smiley, A.B., Ohio State University, 1933; M.D., 1937.
Helman C. Wasserman, A.B., Johns Hopkins University, 1928; M.D., Washington University, 1932.
Carol F. Williams, B.A., University of Tennessee, 1952; M.D., 1955.
Seth E. Wisner, A.B., Washington University, 1942; M.D., 1945.
George J. L. Wulff, Jr., A.B., Washington University, 1929; M.D., 1933.

Assistant Professor Emeritus (Clinical)
Kevin C. Morrin, M.B., B.Ch., National University of Ireland, 1921.

Instructor
Samad Montazee, M.D., Shiraz Medical School (Iran), 1961.

Instructors (Clinical)
Hubert L. Allen, A.B., University of Kansas, 1932; M.D., Tulane University, 1936.
Joe E. Belew, A.B., Central College, 1953; M.D., St. Louis University, 1957.
Bryce H. Bondurant, A.B., Northeast Missouri State Teachers College, 1936; D.O., Kirksville College of Osteopathy and Surgery, 1940; M.D., Washington University, 1943.
(On leave of absence)
S. Michael Freiman, A.B., Montana State University, 1951; M.D., Washington University, 1955.
Ira Clyde Gall, B.S., University of Cincinnati, 1948; M.D., 1951.
Justin F. Kraner, M.D., University of Michigan, 1949.
Joseph Marmet, M.D., University of Zurich, Switzerland, 1962.
Paul F. Max, B.S., Washington University, 1932; M.D., 1932.
Frank A. Merrins, B.S., Washington University, 1935; M.D., 1936.
Gerald Newport, A.B., Washington University, 1948; M.D., 1953.
John B. O'Neill, B.S., St. Louis University, 1925; M.D., 1927.
Harry E. Raybuck, Jr., A.B., Westminster College, 1949; M.S., St. Louis University, 1951; Ph.D., 1953; M.D., Medical College of Georgia, 1959.
Marvin Renard, A.B., Washington University, 1947; M.D., 1952; B.S., University of Missouri, 1950; M.S., 1950.
Melvin M. Schwartz, A.B., University of Nebraska, 1945; M.D., 1947.
Frances H. Stewart, M.D., Washington University, 1927.
Herman Taute, M.D., Philippus University (Marburg/Lahn, West Germany), 1954.
M. Bryant Thompson, M.D., University of California, 1961.
Alva C. Trueblood, Jr., A.B., Washington University, 1940; M.D., 1943.
J. Leslie Walker, M.D., University of Tennessee, 1960.
Sol Weisman, A.B., Washington University, 1928; M.D., 1932.
Mitchell Yanow, M.D., Washington University, 1941.

Instructor Emeritus (Clinical)
Grover B. Liese, A.B., Real-Gymnasium, Cassel, Germany, 1910; M.D., University of Heidelberg (Germany), 1918.

Assistants (Clinical)
Godefredo M. Herzog, B.S., Louisiana State University, 1933; M.D., Washington University, 1957.
Instruction in Obstetrics and Gynecology commences with the second semester of the second year and continues through the third and fourth years.

SECOND YEAR

A series of lectures is given to familiarize the student with the physiological and biochemical aspects of the reproductive processes as they relate to Obstetrics and Gynecology. Clinical application is emphasized.

THIRD YEAR

The student devotes six weeks to intensive clinical experience in the hospital and outpatient department. He attends prenatal clinics and assists at the delivery of selected patients; is assigned selected gynecological patients and acquires familiarity with the surgical techniques employed; and attends scheduled teaching sessions in which the clinical aspects of Obstetrics and Gynecology are discussed.

Students at some time during either the third or fourth year are encouraged to attend the Planned Parenthood Clinic for practical instruction in the various methods of family planning.

FOURTH YEAR

Instruction in the fourth year is entirely elective. The electives are sufficiently varied to permit the individual student to get either limited or extensive additional experience in Obstetrics and Gynecology.

ELECTIVES

Seminar: Advanced Obstetrics. Students interested in Obstetrics will be given the opportunity to study the literature pertaining to many of the complications of pregnancy. The various topics assigned will be discussed with members of the faculty. The seminar will be of especial value to students taking clerkships in Obstetrics.
Seminar: Advanced Gynecology. Students interested in Gynecology will be given the opportunity to study the literature pertaining to the diseases and disorders peculiar to women, including endocrine disorders and fertility. The assigned topics will be discussed in a systematic manner with selected members of the faculty. This seminar will be of especial value to students taking clerkships in Gynecology.

Research. Students interested in research in the broad area of reproduction may actively participate in research current in the Department. Students may also be assigned specific research problems. A personal interview is required before admission to this elective.

Research in myometrial physiology. Dr. Csapo
Research in steroids in reproductive physiology. Dr. Wiest
Research in ultrastructure of generative tract. Dr. Friedrich

The following clinical externships are available:
1. Ob.-Gyn. Clinic, W. U. Clinics. Dr. Momtazee
2. Obstetrics, Barnes-Maternity. Dr. Woolf
3. Gynecology, Barnes-Maternity. Dr. Momtazee
4. Gynecologic Oncology, Barnes-Maternity. Dr. Camel
5. Gynecologic Pathology, Barnes-Maternity. Dr. Black
6. Obstetrics and Gynecology, Jewish Hospital. Dr. Rothman
7. Obstetrics and Gynecology, St. Luke's Hospital. Dr. Wulff
8. Obstetrics and Gynecology, Homer G. Phillips Hospital. Dr. Monat

These clerkships provide opportunity for the student to obtain clinical proficiency in the various aspects of clinical obstetrics and gynecology. A combination of one or more of these clerkships with the seminars will provide excellent foundation for residency training in obstetrics and gynecology.
A senior medical student performs a tonometry test on a patient under the supervision of Dr. Morton Smith.

DEPARTMENT OF OPHTHALMOLOGY

Professor and Head of the Department
Bernard Becker, A.B., Princeton University, 1941; M.D., Harvard University, 1944.

Professor Emeritus (Clinical)
Martin Hayward Post, A.B., Amherst College, 1908; M.D., Johns Hopkins University, 1912.

Associate Professors
Marguerite A. Constant (Biochemistry), B.S., George Washington University, 1947; Ph.D., University of Wisconsin, 1951.

Robert A. Moses, A.B., Johns Hopkins University; M.D., University of Maryland School of Medicine, 1942.

Research Associate Professors
Adolph I. Cohen, B.S., City College of New York, 1948; M.A., Columbia University, 1950; Ph.D., 1954. (See Department of Anatomy)
Jay M. Enoch, B.S., Columbia University, 1950; Ph.D., Ohio State University, 1956.
Associate Professors (Clinical)

Howard Rommel Hildreth, M.D., Washington University, 1928.
Theodore Eugene Sanders, B.S., University of Nebraska, 1931; M.D., 1933.

Associate Professors Emeriti (Clinical)

Bennett Young Alvis, B.S., St. Louis University, 1916; M.D., 1918.
Frederick Oscar Schwartz, M.D., Washington University, 1910.

Assistant Professors

Morton Smith, B.S., University of Maryland, 1956; M.D., 1960.

Assistant Professors (Clinical)

Edmund B. Alvis, M.D., Washington University, 1934.
Andrew J. Gay, B.S., University of Alabama, 1950; M.A., 1954; M.D., Medical College of Alabama, 1955. (See Department of Neurology)
Jack Kayes, B.A., Yale University, 1953; M.D., Washington University, 1957.
Benjamin Milder, M.D., Washington University, 1939.
Edward Okun, M.D., University of Vermont, 1956.
Harry David Rosenbaum, M.D., Washington University, 1934.
Bernd Silver, B.S., University of Louisville, 1952; M.D., 1956.

Instructors

George H. Bresnick (National Institute of Neurological Diseases and Blindness Special Fellow), B.A., Harvard University, 1959; M.D., New York University, 1963.
Stein M. Podos, A.B., Princeton University, 1958; M.D., Harvard University, 1965. (On leave of absence)

Instructors (Clinical)

Daniel Biso, B.A., University of Wisconsin, 1927; M.D., Johns Hopkins University, 1931.
Isaac Boniuk, B.S., Dalhousie University, 1958; M.D., 1962. (On leave of absence)
James Howard Bryan, A.B., Washington University, 1932; M.D., 1936.
Samuel A. Canaan, Jr., A.B., State University of Iowa, 1942; M.D., Meharry Medical College, 1954.
Ruth Schreiber Freedman, A.B., Washington University, 1938; M.D., 1942.
David Merrill Freeman, A.B., University of Missouri, 1940; B.S. in Medicine, 1941; M.D., Washington University, 1943.
Jack Hartstein, B.S., University of Missouri, 1953; M.D., University of Cincinnati, 1955.
Glen P. Johnston, A.B., Washington University, 1953; M.D., 1956.
Lawrence T. Post, Jr., M.D., Washington University, 1948.
Maxwell Rachlin, M.D., University of Ontario, 1942.
Mickey L. Salmon, M.D., Louisiana State University, 1959.
Philip T. Shahan, A.B., Harvard University, 1938; M.D., Washington University, 1942.
Arthur W. Stickle, Jr., M.D., University of Oklahoma, 1943.
Howard P. Venable, B.S., Wayne State University, 1935; M.D., 1940.
Charles E. Windsor, A.B., Carleton College, 1956; M.D., University of Rochester, 1960.

Research Instructors

Walter J. Grodzki, D.D.S., St. Louis University, 1944.
The instruction in the Department of Ophthalmology begins in the second year with methods of examination of the eye. Emphasis is placed on the use of the ophthalmoscope in the first three-hour session. Three additional two-hour sessions are devoted to other methods of examination. During the second year a series of nine didactic lectures is given as an introduction to various aspects of ocular disease. During the third year students are assigned to an ophthalmology clerkship for one week. In the fourth year, a three-week ophthalmology elective is offered to senior students. This elective affords opportunity for work with patients under supervision.

SECOND YEAR

**Ophthalmology.** Lectures and demonstrations are given as part of the course in Conjoint Medicine as well as additional lectures.

(Drs. Moses, Drews, Kolker, Smith, and Resident Staff)

THIRD YEAR

**Ophthalmology.** All students rotate through the eye clinic for a one-week clinical clerkship.

FOURTH YEAR

**Clinical Ophthalmology.** Practical instruction in diagnosis and treatment of eye diseases is given to senior students, who rotate through ophthalmology on a three-week elective.

(Dr. M. Smith)

**ELECTIVES**

(439) **Seminar.** A course in the basic principles of vision is conducted under the supervision of the Departments of Psychology and Ophthalmology.

(Dr. Enoch)

**Clinical Clerkship.** This is a combined Ophthalmology-Otolaryngology elective which runs for six weeks. The senior students rotating through Ophthalmology will be taught the use of ophthalmologic instruments, as well as how to conduct a routine eye examination. There will be rotations through the various subspecialties, including neuro-ophthalmology, motility, ocular pathology, and other possible areas.

(Dr. M. Smith)

**RESEARCH ELECTIVES**

Retinal physiology.

Experimental and clinical research in glaucoma.

Experimental and diagnostic ophthalmic pathology.

(Dr. Enoch)

(Dr. Becker)

(Dr. M. Smith)

Note—The number in parentheses indicates that the course carries credit in the Graduate School of Arts and Sciences and may be found under that number in the Bulletin of that School.
After an operation, Dr. Joseph H. Ogura, Head of the Department of Otolaryngology, discusses procedures with residents.

DEPARTMENT OF OTOLARYNGOLOGY

Otolaryngology is presented to the students during the sophomore, junior, and senior years. In the sophomore year the importance of careful examination of the ear, nose, and throat is emphasized, and the students are taught the use of instruments peculiar to the specialty. In the junior year lectures are given which are intended to supplement the information obtainable in textbooks. In the senior year the student examines patients in the outpatient clinics. Those students who have a particular interest in the specialty are accepted for an elective period during their senior year.

Lindburg Professor and Head of Department
Joseph H. Ogura, A.B., University of California, 1937; M.D., 1941.

Professors
Sol Richard Silverman (Audiology), A.B., Cornell University, 1933; M.S., Washington University, 1938; Ph.D., 1942.

Research Professors
Donald H. Eldredge, S.B., Harvard University, 1943; M.D., 1946.
Ira J. Hirsh (Audiology), A.B., New York State College for Teachers (Albany), 1942; M.A., Northwestern University, 1943; M.A., Harvard University, 1947; Ph.D., 1948.
Catherine A. Smith, A.B., Washington University, 1933; M.S., 1948; Ph.D., 1951.

Professor Emeritus
Walter Page Covell, B.S., Oregon State College, 1921; M.S., 1923; Ph.D., University of Minnesota, 1926; M.D., University of Chicago, 1933. (See Department of Anatomy)

Research Professor Emeritus and Lecturer
Hallowell Davis (Research), A.B., Harvard University, 1918; M.D., 1922. (See Department of Physiology)

Associate Professors
Ruediger Thalmann (Audiology), M.D., University of Vienna, 1954.

Associate Professor (Clinical)

Associate Professor Emeritus (Clinical)
French K. Hansel, M.D., St. Louis University, 1918.

Assistant Professors
Hugh Biller, M.D., Marquette University, 1960.
Masashi Kawasaki, B.A., University of Western Ontario, 1953; M.D., 1957.

William F. Marovitz (Anatomy), B.A., University of California, 1962; Ph.D., 1966. (See Department of Anatomy)
Lindsay Pratt, B.S., Muhlenberg College, 1949; M.D., Jefferson Medical College, 1953; M.S., Temple University, 1960.

Assistant Professors (Clinical)
William T. K. Bryan, A.B., Washington University, 1929; M.D., 1933.
Harold M. Cutler, A.B., University of Maine, 1930; M.D., Tufts College, 1937.
Morris Davidson, B.S., Indiana University, 1936; M.D., 1938.
L. Wallace Dean, Jr., B.S., Yale University, 1930; M.D., Washington University, 1933.
Guerdan Hardy, M.D., Washington University, 1929.
Daniel D. Klaff, B.S., University of Virginia, 1933; M.D., 1936.
Edward H. Lyman, B.S., Washington University, 1937; M.D., 1937.
Herbert M. Smit, M.D., St. Louis University, 1933.
Robert E. Votaw, B.S., State University of Iowa, 1927; M.D., 1929.
Joseph Warren West, M.D., Duke University, 1944.

Assistant Professors Emeriti (Clinical)
Alfred J. Cone, B.S., State University of Iowa, 1921; M.D., 1923; M.S., 1927.
Harry N. Glick, A.B., Cornell University, 1916; M.D., St. Louis University, 1922.

Lecturer
Oren L. Brown (Voice Therapy), M.A., Boston University, 1946.

Research Instructor
Marian Pfingsten Bryan, A.B., Washington University, 1931.

Instructors (Clinical)
Bernard Adler, B.S., Washington University, 1937; M.D., 1937.
A. Chesterfield Stutsman, B.S., Roanoke College, 1927; M.D., University of Virginia, 1931.
Wayne A. Viers, B.S., Phillips University, 1952; M.D., University of Oklahoma, 1956.

Research Assistants
Charles Carr.

Wayne A. Viers, B.S., Phillips University, 1952; M.D., University of Oklahoma, 1956.

Assistants
Frederick Waldman (Audiology), B.S., Upsala College, 1963; M.S., Seton Hall University, 1966.

SECOND YEAR
Otolaryngology and Physical Diagnosis. Clinical pathologic correlative lectures in otolaryngology are given to the entire class.
(Dr. Ogura)

THIRD YEAR
Otolaryngology Clerkship. Practical instruction in diagnosis and treatment is given to one-fourth of the class. Two weeks.
(Drs. Votaw, West, Cutler, Davidson, Cone, Lyman)

FOURTH-YEAR ELECTIVES
Structure and Innervation of Labyrinth.
Clinical Clerkship. A three-week rotation in clinical areas of nasopulmonary, audiology, and vestibular function labs.
(Drs. Ogura, Stroud, and Clinical Staff)
Basic Science Review. Fundamental principles of anatomy and physiology of head and neck; lectures and dissection.
(Dr. Marovitz and Staff)

Research
Cytology, neurology, and histochemistry of membranous labyrinth. (Dr. M. Smith)
Physiology of larynx. (Drs. Ogura and Kawasaki)
Nasopulmonary physiology. (Dr. Ogura)
Physiology of the inner ear. (Dr. Thalmann)
Otoneurology labs. (Dr. Stroud)
Development of otic capsule and ossicles. (Dr. Marovitz)
DEPARTMENT OF PATHOLOGY

Pathology for medical students is given during the second, third, and fourth years. In the second year the course covers General and Special Pathology, and in the third and fourth years the students attend the Clinical and Pathological Conferences conducted in collaboration with the Clinical Departments.

Properly qualified students may register in the School of Medicine or Graduate School of Arts and Sciences for any of the courses. Pathology 501 is a prerequisite for all other courses.

The staff in pathology of several hospitals in and about St. Louis are members of the faculty of the Department: DePaul Hospital, Dr. J. Bauer, Dr. R. Long; St. Luke's Hospital, Dr. F. Kraus; Homer G. Phillips Hospital, Dr. M. Menendez, Dr. U. Scalford;
Ellis Fischel State Cancer Hospital, Dr. C. Perez-Mesa; Missouri Baptist Hospital, Dr. W. Platt; Lutheran Hospital, Dr. L. Yuan; Washington University, Dr. V. Loeb; St. Louis City Hospital, Dr. F. Barrios-Granguillhome, Dr. J. Miller; Ralston Purina Company, Dr. R. Dahlgren.

For purposes of both teaching and research, the Department of Pathology is divided into specialties under the following directors:

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<tr>
<th>Specialty</th>
<th>Director</th>
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<tr>
<td>Arteriosclerosis</td>
<td>Dr. W. Stehbens</td>
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<td>Automated Clinical Chemistry</td>
<td>Dr. G. Kessler</td>
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<td>Cardiac Pathology</td>
<td>Dr. R. Ahlvin</td>
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<td>Clinical Microbiology</td>
<td>Dr. A. Sonnenwirth</td>
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<td>Clinical Pathology</td>
<td>Dr. V. Loeb, Jr.</td>
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<td>Computer Applications</td>
<td>Dr. L. Alvarez</td>
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<td>Cytosurgical Pathology</td>
<td>Dr. I. Del Rosario</td>
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<td>Dentistry</td>
<td>Dr. N. Rowe</td>
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<td>Dermatopathology Virology</td>
<td>Dr. M. McGavran</td>
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<td>Developmental Biology</td>
<td>Dr. C. Smith</td>
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<td>Diseases of Bone and Joint</td>
<td>Dr. R. Silberberg</td>
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<td>Experimental Oncology</td>
<td>Dr. J. Rosari</td>
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<td>Gastrointestinal Pathology</td>
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<td>Hematopoietic Pathology</td>
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<td>Dr. M. Smith</td>
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<td>Neoplasia</td>
<td>Dr. J. Meyer</td>
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<td>Neuropathology</td>
<td>Drs. Schlaepfer, Torack</td>
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<td>Pancreatic Islets</td>
<td>Drs. Greider, Kostianovsky</td>
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<td>Pathology of the Endocrines</td>
<td>Dr. P. Lacy</td>
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<td>Pathology of the Placenta</td>
<td>Dr. V. Bleisch</td>
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<td>Pathology of Thyroid</td>
<td>Dr. W. Bauer</td>
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<td>Protein Chemistry</td>
<td>Dr. L. Jarett</td>
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<td>Pulmonary Pathology</td>
<td>Dr. C. Kuhn</td>
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<td>Renal Histochemistry</td>
<td>Dr. M. Kyriakos</td>
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<td>Serology and Blood Banking</td>
<td>Dr. H. Silver</td>
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<td>Steroid Biochemistry</td>
<td>Dr. S. Stevens</td>
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<td>Surgical Pathology</td>
<td>Drs. Ackerman, Perez, Sheffield</td>
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<td>Thyroid Function</td>
<td>Dr. S. Teitelbaum</td>
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<td>Tissue Culture</td>
<td>Dr. O. Pettengill</td>
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Edward Mallinckrodt Professor and Head of Department
Paul E. Lacy, B.A., Ohio State University, 1945; M.D., 1948; M.Sc., 1948; Ph.D., University of Minnesota, 1955.

Professor
Lauren V. Ackerman (Pathology and Surgical Pathology), A.B., Hamilton College, 1927; M.D., University of Rochester, 1932.
Ruth Silberberg, M.D., University of Breslau, 1931.
George D. Sorensen, B.S., Pennsylvania State University, 1950; M.D., Jefferson Medical College, 1954.
William E. Stehbens, B.Med. and B.Surg., University of Sydney, 1950; D.Phil., Oxford University, 1960; M.D., University of Sydney, 1962. (Jewish Hospital)

Professor Emeritus and Lecturer
Margaret Gladys Smith, A.B., Mount Holyoke College, 1918; M.D., Johns Hopkins University, 1922. (See Department of Pediatrics)

Associate Professors
Walter C. Bauer, B.S., Ohio State University, 1946; M.D., Washington University, 1954.
Virgil R. Bleisch, M.D., Washington University, 1948. (City Hospital)
Joe W. Grisham (Markle Scholar), A.B., Vanderbilt University, 1953; M.D., 1957.
Phyllis M. Hartroft, B.S., University of Michigan, 1949; M.A., University of Toronto, 1951; Ph.D., 1954.
Gerald Kessler, B.S., City College of New York, 1950; M.S., University of Maryland, 1952; Ph.D., 1954. (Jewish Hospital)
John Kissane, A.B., University of Rochester, 1948; M.D., Washington University, 1952. (See Department of Pediatrics)
Richard Torack, B.S., Seton Hall University, 1948; M.D., Georgetown University, 1952.

Assistant Professors
Robert C. Ahlvin, B.S., Iowa State College, 1950; M.D., Washington University, 1954. (Jewish Hospital)
John D. Bauer, B.Sc., University of Innsbruck, 1938; L.R.C.P. and S., University of Glasgow, 1944; M.D., Marquette University, 1947. (Visiting Staff)
William C. Black, M.D., University of Colorado, 1957.
Marie Greider, B.S., Ohio State University, 1949; M.S., 1955; Ph.D., 1960.
Leonard Jarett (Markle Scholar), B.A., Rice University, 1938; M.D., Washington University, 1962. (See Department of Medicine)
Frederick T. Kraus, B.A., College of William and Mary, 1951; M.D., Washington University, 1955. (Visiting Staff)
Charles Kuhn, A.B., Harvard University, 1955; M.D., Washington University, 1959. (V.A. Hospital)
Virgil Loeb, Jr., M.D., Washington University, 1944. (See Department of Medicine) (Visiting Staff)
Johs S. Meyer, B.A., Yale University, 1952; M.D., Washington University, 1956. (V.A. Hospital)
Olive S. Pettengill, A.B., Temple University, 1945; M.S., Brown University, 1948; Ph.D., Boston University, 1960.
William R. Platt, B.S., University of Maryland, 1936; M.D., 1940. (Visiting Staff)
Raymond A. Rondez, M.D., University of Geneva, 1954. (Jewish Hospital)
Carl H. Smith, B.A., Swarthmore College, 1955; M.D., Yale University, 1959. (See Department of Pediatrics)
Sue Cassell Stevens, A.B., Goucher College, 1930; M.A., 1931; Ph.D., Columbia University, 1940. (Jewish Hospital)
Thomas W. Tillack, A.B., University of Rochester, 1939; M.D., Yale University, 1963.
THE SCHOOL OF MEDICINE


Instructors

Luis Alvarez, M.D., University of Santo Domingo, 1958. (City Hospital)

Francisco Barrios-Granguillhome, M.D., National University of Mexico, 1938. (Visiting Staff)

Robert R. Dahlgren, B.S., Oklahoma State University, 1962; D.V.M., 1963; M.Sc., 1966. (Visiting Staff)

Luis Q. Del Rosario, M.D., University of Santo Tomas, 1954. (City Hospital)

Mery Kostianovsky, M.D., Universidad Nacional del Litoral (Rosario) Argentina, 1958. (Jewish Hospital)

Robert W. Long, B.A., University of Nebraska, 1950; M.D., Marquette University, 1961. (Visiting Staff)

Manuel F. Menendez, B.S., University of Havana, 1949; M.D., 1956. (Visiting Staff)

James R. Miller, A.B., Washington University, 1952; M.D., St. Louis University, 1960. (Visiting Staff)

Blanca M. Perez, B.A., Universidad del Valle (Colombia), 1953; M.D., 1961. (Jewish Hospital)

Carlos Perez-Mesa, M.D., University of Havana, 1950. (Visiting Staff)

Juan Rosari, B.A., Colegio Nacional 9, Justo Jose de Urquiza, 1956; M.D., Escuela de Medicina de la Universidad de Buenos Aires, 1961.

Ursula Sclafford, B.S., Howard University, 1942; M.D., 1945. (Visiting Staff)

William H. Sheffield, B.A., Yale University, 1957; M.D., George Washington University, 1961. (Jewish Hospital)

Gregorio Sierra, B.S., Institute of Manzaniillo, 1945; M.D., Havana University, 1954. (Visiting Staff)

Herbert Silver, B.A., Adelphi College, 1953; M.D., University of Buffalo, 1957. (Jewish Hospital)

Steven L. Teitelbaum, B.A., Columbia University, 1960; M.D., Washington University, 1964. (Jewish Hospital)

Louis S. K. Yuan, M.D., Aurora University (China), 1938. (Visiting Staff)

Research Assistants

Rebecca J. Burcham.


Raymond Jackson, A.B., Washington University, 1959.

SECOND YEAR

(501). Pathology. General and special pathology are covered by lectures, gross and microscopic demonstrations, and laboratory work. In general pathology, degenerations, inflammations, infectious diseases, and tumors are considered. The diseases of each organ system are studied during the time devoted to special pathology. Small groups are given instruction in post-mortem technique and in gross pathology. 288 hours.

(Staff)

THIRD YEAR

Clinical and Pathological Conference. The clinical history and treatment of patients who have died are discussed before the class by the physicians and surgeons of the departments concerned. These conferences afford the students an opportunity to interpret the clinical observations in the light of the post-mortem findings. One hour a week during the third year.

(Staff)
FOURTH YEAR

Clinical and Pathological Conference. The clinical history and treatment of patients who have died are discussed before the class by the physicians and surgeons of the departments concerned. These conferences afford the students an opportunity to interpret the clinical observations in the light of the post-mortem findings. One hour a week during the fourth year. (Staff)

Tumor Conference. One hour each week for twelve weeks during the surgery and obstetrics and gynecology trimester. Problem cases are presented for illustration and discussion of all aspects of neoplastic disease. 12 hours. (Staff)

ELECTIVE COURSES

(502). Major Research. The laboratory offers facilities for research in pathology. Specialists and students with adequate training who desire to extend their knowledge of pathology will be admitted. (Staff)

(595). Journal Club. The current journals concerned with morphological and experimental pathology and oncology are reviewed by the members of the staff. Properly prepared students may attend or participate. (Staff)

(596). Seminar in Gross Pathology. The autopsies for the affiliated hospitals are performed by the junior members of the staff. The entire Department meets, and the cases are evaluated by the senior staff at this conference. Two hours once a week throughout the year. (Staff)

(597). Seminar in Microscopic Pathology. The microscopic sections from each autopsy are presented by the prosector at a conference. The Department offers facilities for fulfilling requirements for the degree of Ph.D. in Pathology. (Staff)

SEMINAR ELECTIVES

Ultrastructural Pathobiology. This seminar will be based on a detailed consideration of the general ultrastructural features of cells, including a comprehensive review of these features in terms of normal biological function and of deranged functions associated with pathobiological conditions. (Dr. Sorenson and Staff)

Correlative Pathology. In depth presentation of selected topics on disease constellations to include recent advances in morphology and clinicopathologic correlation. The topics include cardiomyopathies, glomerulopathies, chronic pulmonary indurative diseases, etc. (Dr. Kissane)

Note—The numbers in parentheses indicate that the courses carry credit in the Graduate School of Arts and Sciences and may be found under that number in the Bulletin of that School.
Correlative Pediatric Pathology (may be taken only as a continuation of Correlative Pathology). In depth presentation of selected topics on disease constellations peculiar to the pediatric age group to include recent advances in morphology and clinicopathologic correlation. The topics include the newborn lung, fibrocystic disease, etc. (Dr. Kissane)

CLERKSHIP ELECTIVES

Autopsy Pathology I.
Autopsy Pathology II.
Autopsy Pathology III.
Autopsy Pathology IV.

Students actively participate in the autopsy service for six weeks (Autopsy Pathology I) or twelve weeks (Autopsy Pathology II), performing post-mortem examinations under supervision, attending and participating in departmental conferences, and attending interdepartmental conferences.

During an additional six weeks (Autopsy Pathology III and IV), students may elect work under the supervision of a staff member developing mutually agreed upon innovative techniques for possible inclusion in the post-mortem examination or correlative studies using stored autopsy derived information. (Staff)

Surgical Pathology I.
Surgical Pathology II.

Students participate fully in activities of the Division of Surgical Pathology. They are responsible for dissection and description of gross specimens and microscopic diagnosis under supervision. Students attend morning conferences with the director, surgical and medical grand rounds and medical CPC. In addition, Surgical Pathology II includes rotations through subspecialties: Neuropathology, Dermatopathology, and Gynecologic Pathology. (Dr. W. Bauer and Staff)

Comparative Pathology I.
Comparative Pathology II.

An opportunity for medical students to increase their knowledge and appreciation of pathologic phenomena in species other than man. Concentration may be elected on laboratory animals, domestic animals, livestock, poultry, and captive wild animals (St. Louis Zoo). (Drs. McGavern and Wallach)

RESEARCH ELECTIVES

Regulation of Cellular Proliferation in the Liver. (Specific topics may be selected after discussion with Dr. Grisham.)

Evolution of Pathologic Lesions in the Liver in Organ Culture. (Dr. Grisham)
Location of Erythropoietin-secreting Cells in the Kidney. (Dr. Hartroft)
Identification of Renin-secreting Cells in the Pregnant Uterus. (Dr. Hartroft)
Relation of Erythropoietin Level to JG Cell Granulation. (Dr. Hartroft)
Effects of High Altitude on Ultrastructure of JG Cells. (Dr. Hartroft)
Effects of High Altitude on JG Cell Granulation, Erythropoietin, Renin, and the Adrenal Cortex. (Dr. Hartroft)
Any worthy project related to the above categories. (Dr. Hartroft)
Studies of Peptide Hormone Binding to Plasma Membranes. (Dr. Jarett)
Instruction in and Application of Quantitative Microchemical Techniques to Architecturally Defined Tissue Samples from Experimental Animals. (Dr. Kissane)
Electron Microscopic Histochemistry of Lung with Emphasis on the Secretory Activity of Alveolar Cells. (Dr. Kuhn)
Research in Experimental Diabetes. (Dr. Lacy)
Antigenic Determinants of Cytomegaloviruses. (Dr. McGavran)
Cytopathology and Chronic Parasitism by the Cytomegaloviruses. (Dr. McGavran)
Comparative Pathology. (Dr. McGavran)
Dermatopathology. (Dr. McGavran)
Aflatoxin Carcinogenesis. (Dr. McGavran)
Electron Microscopic Studies of Parafollicular Cells of the Thyroid Gland with Emphasis on Their Characteristics in Human Beings and Their Occurrence in Neoplasms, Natural and Experimentally Induced. (Dr. Meyer)
Studies on Hematopoietic Tissues in Cell Culture. (Dr. Pettengill)
Experimental Neuropathology. (Dr. Schlaepfer)
Aging of the Skeleton. (Dr. Silberberg)
Pathogenesis of Osteoarthrosis. (Dr. Silberberg)
Ultrastructural and Biochemical Aspects of Globulin Synthesis and Secretion by Lymphoid and Plasma Cells. (Dr. Sorenson)
Pathogenesis of Atherosclerosis and Electron Microscopy. (Dr. Stehbens)
Experimental Neuropathology. (Dr. Torack)
Cellular Mechanisms of Lipid Transport and Fatty Metamorphosis. (Dr. Williamson)
Factors Influencing Leukocytic Emigration, Phagocytosis, and Inflammation. (Dr. Williamson)
The primary aim of the Department of Pediatrics in the undergraduate teaching program is to stimulate interest in developmental biology, especially human growth and development, and to provide the student with a foundation sufficiently comprehensive so that he will have an appreciation of pediatric problems regardless of his future choice of a career in medicine.

The major clinical and research facilities are in the St. Louis Children’s Hospital and the St. Louis Maternity Hospital. The former has a bed capacity of 165, and accepts all types of problems in children under sixteen years of age, averaging about 6,000 yearly admittances. The Pediatric Outpatient Department is conducted in the hospital and averages about 40,000 yearly visits. In the Medical Center the yearly number of newborn infants averages more than 4,000.
Professor and Head of the Department
Philip R. Dodge, M.D., University of Rochester, 1948. (See Department of Neurology)

Professors
David Goldring, A.B., Washington University, 1936; M.D., 1940.
William H. McAlister, B.S., Wayne State University, 1950; M.D., 1954.

Professor Emeritus
Margaret Gladys Smith, A.B., Mount Holyoke College, 1918; M.D., Johns Hopkins University, 1922. (See Department of Pathology)

Professor Emeritus (Clinical)
Borden Smith Veeder, M.D., University of Pennsylvania, 1907; Sc.D., Colgate University, 1929.

Associate Professors
M. Rensis Behrer, A.B., Williams College, 1942; M.D., Long Island College of Medicine, 1945.
Alexis F. Hartmann, Jr., B.S., Washington University, 1951; M.D., 1951.
John C. Herweg, B.S., Drury College, 1943; M.D., Washington University, 1945.
John Kissane, A.B., University of Rochester, 1948; M.D., Washington University, 1952.
J. Neal Middelkamp, B.S., University of Missouri, 1946; M.D., Washington University, 1948.
Mark A. Stewart, B.A., M.A., Cambridge University, 1953; M.R.C.S., L.R., C.P., 1956. (See Department of Psychiatry)
Donald Lionel Thurston, B.S., Vanderbilt University, 1934; M.D., 1937.
Jean Holowach Thurston, B.A., University of Alberta, 1937; M.D., 1941.
Teresa J. Vietti, B.S., Rice University, 1949; M.D., Baylor University, 1953.

Assistant Professors
David N. Dietzler (Pharmacology), A.B., Washington University, 1957; Ph.D., 1963. (See Department of Pharmacology)
Antonio Hernandez, Jr., M.D., Manila Central University, 1954.

Dorothy Jeannette Jones, A.B., Oberlin College, 1930; M.D., Washington University, 1934.
Ferris N. Pitts, Jr., A.B., Washington University, 1952; M.D., 1955. (See Department of Psychiatry)
Arthur L. Prensky, A.B., Cornell University, 1951; M.D., New York University, 1955. (See Department of Neurology)
Mabel L. Purkerson, A.B., Erskine College, 1951; M.D., Medical College of South Carolina, 1956. (See Department of Medicine)
David L. Rimmoin, B.S., McGill University, 1957; M.D., C.M., M.S., 1961; Ph.D., Johns Hopkins University, 1967. (See Department of Medicine)
William S. Sly, M.D., St. Louis University, 1957. (See Department of Medicine)
Carl H. Smith, B.A., Swarthmore College, 1955; M.D., Yale University, 1959. (See Department of Pathology)

Research Assistant Professor
Mary L. Parker, B.S., Florida State University, 1946; M.S., 1949; M.D., Washington University, 1953. (On leave of absence)

Assistant Professors (Clinical)
Max Deutch, M.D., Washington University, 1926.
Stanley Leonard Harrison, B.S., Washington University, 1928; M.D., 1930. (On leave of absence)
Frederick August Jacobs, B.S., Washington University, 1927; M.D., 1928.
Joseph C. Jaudon, A.B., Washington University, 1926; M.D., 1933.
Lawrence I. Kahn, A.B., University of Alabama, 1941; M.D., Louisiana State University, 1945.
Paul H. Painter, M.D., St. Louis University, 1947. (See Department of Psychiatry)
Alfred S. Schwartz, A.B., Amherst College, 1932; M.D., Johns Hopkins University, 1936.

Assistant Professor Emeritus
Ruth E. Martin (Dentistry), D.D.S., Washington University, 1923.
Assistant Professor Emeritus (Clinical)

Park J. White, A.B., Harvard University, 1913; M.D., Columbia University, 1917.

Instructors

Natalie Aronson, A.B., Hunter College, 1942; M.D., New York University College of Medicine, 1947.
John Gilster (Dentistry), D.D.S., Washington University, 1944.
Virginia V. Weldon, A.B., University of Michigan, 1951; M.D., Johns Hopkins University, 1955.

Instructors (Clinical)

Helen M. Aff, B.S., Washington University, 1934; M.D., 1934.
Edward T. Barker, A.B., Princeton University, 1953; M.D., Washington University, 1957.
Joseph A. Bauer, M.D., Washington University, 1926.
Benjamin B. Berman, M.D., Washington University, 1939.
Gordon R. Bloomberg, A.B., University of Illinois, 1935; B.S., 1935; M.D., 1939. (On leave of absence)
Clifford Reed Boles, A.B., Washington University, 1940; M.D., 1943.
Martin Calodney, B.S., College of the City of New York, 1930; M.D., New York University, 1936.
Ira J. Friedman, B.S., University of Arkansas, 1955; M.D., 1960.
Robert H. Friedman, M.D., Washington University, 1948.
Samuel Gollub, B.S., Washington University, 1941; M.D., 1941.

Gene Grabau, B.S., St. Louis College of Pharmacy, 1937; M.D., Washington University, 1942.
Roman E. Hamnes, B.A., University of Iowa, 1950; M.D., 1954.
Norman Hankin, A.B., University of Wisconsin, 1940; M.D., 1943.
Maurice J. Keller, A.B., Yale University, 1936; M.D., Columbia University, 1940.
Sheldon Kessler, M.D., St. Louis University, 1951.
Henry L. Knick, A.B., Johns Hopkins University, 1949; M.D., 1952.
Kenneth Albert Koerner, A.B., Washington University, 1935; M.D., 1941.
Marian Kuttner, M.D., Johann Wolfgang Goethe University (Frankfurt am Main), 1931.
Sol Londe, B.S., Washington University, 1925; M.D., 1927.
Richard Margolis, B.S., College of William and Mary, 1947; M.D., Western Reserve University, 1951.
John C. Martz, A.B., University of Missouri, 1938; M.D., Washington University, 1942.
David McClure, M.D., University of Tennessee, 1940.
Helen Nash, A.B., Spelman College, 1942; M.D., Meharry Medical College, 1945.
 Homer Nash, M.D., Spelman College, 1942; M.D., Meharry Medical College, 1945.
W. Neal Newton (Dentistry).
Frederick D. Peterson, A.B., Knox College, 1933; M.D., Washington University, 1937.
Eugenia M. Pierce, M.D., St. Louis University, 1938.
Steven I. Plax, A.B., University of Missouri, 1957; M.D., 1961.
Edith C. Robinson, A.B., Randolph-Macon College, 1927; M.S., University of South Carolina, 1928; M.D., Johns Hopkins University, 1932. (See Department of Psychiatry)
Second Year

In the course in Applied Pathologic Physiology, the student is introduced to pediatrics and the full-time staff through a series of lectures designed to acquaint him with the concepts of human growth and development, genetics, and the effects of age and maturity on the reaction to injury and disease. In addition, a series of lectures is given highlighting the important disorders commonly encountered in infants and children. The unique aspects of the physical examination of the infant and child are presented during the course in Physical Diagnosis.
THIRD YEAR

A clerkship of six weeks is scheduled, during which period the student will participate in the following:
1. Assignment to intern or resident with joint responsibility of caring for inpatients.
2. Daily ward rounds and bedside conferences with house staff and attending physician.
3. Daily afternoon conferences on various pediatric disciplines.

FOURTH-YEAR ELECTIVES

This year will be devoted to elective time which may be spent according to the individual preferences of the student as an intern substitute, in the research laboratory, or by combining clinical and laboratory work. The following electives are offered:

Pediatric Cardiology

Inpatient and Outpatient Service.
Clinical Inpatient Service. The students will participate in the diagnostic workup and management of patients with acquired and congenital heart disease, including critically ill and postoperative patients in the Intensive Care Unit. Activities will include daily ward rounds, precatheterization critiques three times a week, and a weekly conference on catheterization laboratory findings.
Outpatient Service. The student will also participate in the evaluation of new patients for consultation, as well as follow-up of old patients. (Dr. Goldring)

Computer Techniques in Fetal Electrocardiography and Vectorcardiography. This course will be devoted to review and study of the basic principles of computer techniques as they apply to fetal electrocardiography and vectorcardiography. (Dr. Behrer)

Laboratory Diagnostic Procedures. The student will be involved initially as an observer and eventually as a participant in the catheterization and angiocardiographic studies. The theory and interpretation of physiologic data will be reviewed in daily sessions. The student may participate in the other activities of the Pediatric Cardiology Division as time permits. (Dr. Hartmann, Jr.)

The Effect of Digoxin on the Cardiovascular Hemodynamics of the Fetal Lamb. This study will be concerned with the effect of digoxin (tritium labeled) on the cardiovascular hemodynamics of the fetal lamb. The exteriorized fetal lamb preparation will be used. There will be opportunity to learn about cardiac output, blood flow, and the use of isotopes (tritium labeled digoxin) in experimental procedures. (Dr. Hernandez)
Electrocardiography, Vectorcardiography, Phonocardiography. Emphasis will be placed on the electrophysiology and theory as well as interpretation of electrocardiograms, phonocardiograms, and vectorcardiograms on inpatients and outpatients. The student may participate in the other activities of the Pediatric Cardiology Division as time permits. (Dr. Behrer)

Pediatric Neurology

I. During the course of this elective the student assumes responsibility for patients under supervision of the Pediatric Neurology Resident-Fellow. Special attention is devoted to the neurological history and examination of the neonate and child, the diagnosis and treatment of convulsive disorders, the study of congenital defects and developmental abnormalities of the nervous system, and the study of metabolic and degenerative disorders of the central nervous system in infancy and childhood. (Dr. Dodge)

II. The effect of disease on lipid and carbohydrate substrates of the central nervous system will be considered. Projects will be designed to give the student experience in isolating subcellular particles, in measuring substrates by spectrophotometric methods, and in learning some of the techniques of chromatographic separation of chemical classes. Lay, column, and gas liquid chromatography will be emphasized, depending upon the requirements of the project. (Dr. Prensky)

Pediatric Infectious Diseases

Research Opportunities. Laboratory research programs designed to interest and challenge the student are available in the areas of (1) tissue culture, (2) the effects of virus infections during pregnancy, (3) electron microscopy of virus infections, and (4) circadian periodicity of serum amino acids during bacterial and viral infections in animals and man. (Drs. Middelkamp, Herweg, and Feigin)

Clinical Elective. The student will be assigned selected patients on the Isolation Division for initial evaluation and continuing care. Daily ward rounds and scheduled conferences will be attended. Time will be spent each day reading cultures in the diagnostic bacteriology laboratory. Instruction will be given in diagnostic serology. A short library or laboratory project will be completed during the six weeks. (Drs. Middelkamp, Herweg, and Feigin)

Hematology

Hematology and Oncology. The student will be expected to participate actively in the diagnostic workup and follow-up care on all patients seen on the Hematology Service, both in the hospital and the outpatient department. An attempt will be made to assign all new patients to the students. They will follow the patients both in the hospital and on discharge. (Drs. Vietti and Zarkowsky)
Experimental Cancer Chemotherapy. The research project undertaken by the student will be dependent upon the duration of the project and the ability and interest of the student. (Dr. Vietti)

Red Cell Enzyme and Membrane Metabolism. The research project undertaken by the student will be dependent upon the duration of the project and the ability and interest of the student. (Dr. Zarkowsky)

**Clinical Allergy and Immunology.** The student will participate in the outpatient clinic activity and attend rounds, conferences, and lectures related to allergy and immunology. He will also participate in the diagnostic evaluation of inpatients and will be expected to complete a short library or laboratory project in on-going research in allergy. (Dr. Thurston)

**Pediatrics Metabolism.** The in Vivo Effects of Salicylate on the Metabolism of the Heart, Brain, and Liver (Enzymes and Metabolic Substrates) in Young Mice. The student will be exposed to the application of micro-analytical techniques to the pathophysiology and biochemistry of clinical disease. (Dr. Holowach)

**Pediatric Nephrology and Endocrinology.** Students will assist in the evaluation and management of a variety of inpatients and outpatients with pediatric renal and endocrinological diseases. They will be expected to attend and participate in the Journal Club. (Drs. Robson and Weldon)
Dr. Lowry (center) confers with Doctors Burns and Needleman, who are conducting a histology experiment that is videotaped in the laboratory.

THE EDWARD MALLINCKRODT DEPARTMENT OF PHARMACOLOGY

The number of useful drugs is steadily increasing. It is the purpose of the pharmacology course, through discussions of existing drugs, to develop general principles which will be applicable as well to drugs of the future. Pharmacology draws heavily on biochemistry, physiology, and bacteriology for an understanding of drug action. It looks toward pathology, medicine, and surgery for its uses. For this reason the course is constructed as a part of the continuum of medicine rather than a separate discipline. Since many drugs are harmful in excessive amounts, toxicology is included in the course as a logical part of pharmacology.

The laboratory portion of the course is divided roughly in half. The first part consists of selected animal experiments designed to illustrate and give reality to the action of drugs; the second part of the laboratory period is devoted either to a small research
project for each group of four students or to a seminar series concentrating on one particular area of pharmacology. When research projects are scheduled, the problems are of student choice and the results are reported to the class. When seminar courses are scheduled, the groups consist of twenty students and two or three faculty members.

**Professor and Head of the Department**

Oliver Howe Lowry, B.S., Northwestern University, 1932; Ph.D., University of Chicago, 1957; M.D., 1957.

**Professor**

Francis Edmund Hunter, Jr., B.S., Mount Union College, 1938; Ph.D., University of Rochester, 1941.

**Professor Emeritus**

Helen Tredway Graham, B.A., Bryn Mawr College, 1911; M.A., 1912; Ph.D., University of Chicago, 1915.

**Associate Professors**

Helen B. Burch, B.S., Texas State College for Women, 1926; M.S., Iowa State College, 1928; Ph.D., 1935.

Robert M. Burton, B.S., University of Maryland, 1950; M.S., Georgetown University, 1952; Ph.D., Johns Hopkins University, 1955.

David M. Geller, B.A., Amherst College, 1952; Ph.D., Harvard University, 1957.

Stephen C. Kinsky, A.B., University of Chicago, 1951; Ph.D., Johns Hopkins University, 1957.

David B. McDougal, Jr., A.B., Princeton University, 1949; M.D., University of Chicago, 1947.

Janet V. Passonneau, B.A., University of Minnesota, 1945; M.A., Radcliffe College, 1946; Ph.D., Harvard University, 1949.

**Assistant Professors**

Franz M. Matschinsky, M.B., University of Freiburg, 1955; M.D., University of Munich, 1959.

Philip Needleman (Established Investigator of the American Heart Association), B.S., Philadelphia College of Pharmacy and Science, 1960; M.S., 1962; Ph.D., University of Maryland Medical School, 1964.

**Lecturer**

David N. Dietzler, A.B., Washington University, 1957; Ph.D., 1963. (See Department of Pediatrics)

**SECOND YEAR**

(501 and 502). (a) Lectures, conferences, panel discussions. (b) Laboratory course. (Drs. Lowry, Hunter, Burch, Burton, Kinsky, Needleman, McDougal, Geller, Matschinsky, Passonneau)

**ELECTIVE COURSE**

(590). Research. The facilities of the laboratory are available to those who wish to carry on an original investigation on problems of their own or on those the department is prepared to suggest.

Note—The numbers in parentheses indicate that the courses carry credit in the Graduate School of Arts and Sciences and may be found under that number in the Bulletin of that School.
SEMINAR ELECTIVES

Seminar electives dealing with the interaction of drugs with tissue and tissue components.

Kinetics of Pharmacologic Reactions. Mathematical consideration of the binding of drug(s) to bioreceptor(s) and the relationship to enzyme-substrate kinetics.

Receptor Identification and Isolation. The consideration of the experimental approaches to this problem include structure activity relationships, affinity characteristics, types of receptors (nature of pharmacological events in more than one receptor), substrates (agonists), inhibitors (antagonists), evidence for the elucidation of the nature and function of receptors (active centers, binding sites). (Dr. Needleman and Staff)

Biochemistry of the Central Nervous System. (Given in cooperation with the Department of Psychiatry. For details see the course offerings in Psychiatry).

(Drs. McDougal, B. Moore, and Staff)

RESEARCH ELECTIVES

Problems in the biochemical development of rat tissues. (Dr. Burch)

Photophosphorylation and electron transfer in biological systems. (Dr. Geller)

Studies on oxidative phosphorylation and mitochondrial structure, as well as purification and properties of the drug metabolizing enzyme. (Dr. Hunter)

Lytic mechanisms. (Dr. Kinsky)

Metabolism of isolated pancreatic islets. (Dr. Matschinsky)

Comparative neurochemistry, energy metabolism in nerve, biochemical effects of thiamine deficiency. (Dr. McDougal)

The pharmacological and biochemical mechanisms leading to the development of tolerance to nitroglycerine. (Dr. Needleman)
DEPARTMENT OF PHYSIOLOGY AND BIOPHYSICS

The Department offers instruction to medical and graduate students in physiology and biophysics. A course in the second semester of the first year of the medical curriculum is designed to provide students with a foundation for their further study of clinical and applied physiology. In addition, advanced courses open to medical and graduate students provide for more detailed study of specific areas of physiology and biophysics. The following research interests are represented in the Department at the present time: macromolecular structure as studied by X-ray crystallography and other physical methods, the mechanism of action of polypeptide hormones, transport across cell membranes, neurophysiology, contractile activation of muscle, cardiac muscle, peripheral circulation, respiration, and the application of computer techniques to biological problems. The interests in neurophysiology concern principally membrane phenomena in nerve fibers, the function of receptors and sensory systems. Electron microscopy of nerve and muscle is used to relate structure and function in these tissues.
Edward Mallinckrodt, Jr., Professor and Head of the Department

Carlton C. Hunt (Physiology and Biophysics), B.A., Columbia University, 1939; M.D., Cornell University, 1942.

Professors

Jerome Cox, Jr. (Biomedical Engineering), S.B., Massachusetts Institute of Technology, 1947; S.M., 1949; Sc.D., 1954. (Biomedical Computer Laboratory)

Albert Roos (Physiology), M.D., University of Groningen, 1940. (See Department of Surgery)


Gordon Marcus Schoepfel (Physiology and Biophysics), A.B., DePauw University, 1937; A.M., Princeton University, 1939; Ph.D., 1941.

William W. Sleator (Physiology and Biophysics), A.B., University of Michigan, 1938; M.S. 1939; Ph.D., 1946.

Michel M. Ter-Pogossian (Radiation Physics), B.A., University of Paris, 1942; M.S., Washington University, 1948; Ph.D., 1950. (See Department of Radiology)

Professors Emeriti

Hallowell Davis, A.B., Harvard University, 1918; M.D., 1922; Sc.D. (hon.), Colby College, 1954. (See Department of Otolaryngology)  (Also Lecturer)

Arthur S. Gilson, Jr., B.S., Dartmouth College, 1919; A.M., Harvard University, 1922; Ph.D., 1924. (Also Lecturer)

Harvey Lester White, B.S., Washington University, 1918; M.D., 1920. (Also Lecturer)

Associate Professors

Mordecai Blaustein (Physiology and Biophysics), B.A., Cornell University, 1957; M.D., Washington University, 1962.

Stanley Lang (Physiology and Biophysics), Ph.B., University of Chicago, 1946; S.B., 1948; S.M., 1949; Ph.D., 1952.

Charles E. Molnar (Physiology and Biophysics), B.S.E.E., Rutgers University, 1956; M.S.E.E., 1957; Sc.D., Massachusetts Institute of Technology, 1966. (Computer Systems Laboratory)

Assistant Professors

Leonard J. Banaszak (Biophysics), B.S., University of Wisconsin, 1956; M.S., Loyola University, 1961; Ph.D., 1961. (See Department of Biological Chemistry)

William Beacham (Physiology), B.S., University of Utah, 1959; M.D., 1964.

Garland R. Marshall (Physiology and Biophysics), B.S., California Institute of Technology, 1962; Ph.D., Rockefeller University, 1966. (See Department of Biological Chemistry)

F. Scott Mathews (Biophysics), B.S., University of California, 1955; Ph.D., University of Minnesota, 1959. (See Department of Biological Chemistry)

Russell R. Pfeiffer (Engineering Biophysics), B.S., Purdue University, 1949; S.M., Massachusetts Institute of Technology, 1960; Ph.D., 1963. (Electrical Engineering)

Instructors

Frederick W. Kingle (Physiology), A.B., University of Missouri, 1938; M.D., Washington University, 1942. (See Department of Surgery)

Carl Marx Rovainen (Physiology and Biophysics), B.S., California Institute of Technology, 1962; Ph.D., Harvard University, 1967.

Research Instructor

Mohammed Naeem Adal (Physiology), B.S., University of Hong Kong, 1957; M.S., 1961.

Research Assistant

Taisija de Gubareff (Physiology and Biophysics), M.S., Polytechnic Institute (Kiev), 1940.

Research Fellow

Hiroshi Washio (Physiology and Biophysics), B.S., Hokkaido University, 1957; D.Sc., 1965.
Postdoctoral Fellows


Michael Levine (Physiology and Biophysics), B.S., London University, 1961; M.S., 1965; Ph.D., York University, 1968.

FIRST YEAR

(502) Introduction to Physiology. The course of study utilizes lectures, demonstrations, and laboratory experiments. The aim is to provide a basis for understanding general physiological mechanisms and the functional organization of physiological systems that are of immediate or potential importance in medicine. For medical students, the study of physiology should be a continuum extending into the subsequent years of the curriculum.

(Staff)

ELECTIVES

(590) Research Electives. The facilities of the laboratory are offered to qualified students for the investigation of their own problems or of those which the department is prepared to suggest. The most appropriate time for student research is the summer months or free time in the senior year.

Microcirculation. Techniques involving observations of living microcirculatory elements and their reactivity to physiological and pharmacological stimuli. Isolated perfused hind limbs are used for determination of capillary filtration coefficient. Laboratory computer use in microcirculation measurements. (Dr. Lang)

Molecular Biophysics. X-ray diffraction studies on protein molecules. Crystallographic analysis. (Drs. Banaszak and Mathews)

Chemistry and Biophysics of Peptides. Studies of conformation by theoretical and physical techniques. Synthesis of peptide hormones by solid phase. (Dr. Marshall)

Cellular Physiology of Heart Muscle. Research on mechanisms of the spontaneous beat, excitation-contraction coupling, control of contraction strength, effects of calcium and cardiac glycosides. (Dr. Sleator)

Cellular Neurophysiology. Basic theory of neurophysiology, amphibian single fiber air gap preparation, effects of metabolic inhibitors, relation of ionic conductances to metabolic factors, monitoring of ionic exchanges. (Dr. Schoepfle)

Sensory Biophysics. Information processing in the auditory system. Computer applications in physiology. (Dr. Molnar)

Note—The numbers in parentheses indicate that the courses carry credit in the Graduate School of Arts and Sciences and may be found under that number in the Bulletin of that School.
**Engineering Biophysics and Bioacoustics.** Studies in the peripheral auditory nervous system.  
(Dr. Pfeiffer)

**Contractile Activation in Skeletal Muscle.**  
(Dr. Hunt)

**SEMINAR ELECTIVES**

**Molecular Biophysics.** Macromolecular structure and function and the use of physical methods in their study.  
(Drs. Banaszak and Mathews)

**Neurophysiological Mechanisms.** Cellular basis of impulse activity, synaptic transmission, and receptor function. Principles of organization in central nervous system with particular reference to sensation.  
(Dr. Hunt and Staff)

**Biochemistry and Physiology of Peptide Hormones.**  
(Dr. Marshall)

The Department offers to qualified students the opportunity to carry on work leading to the Ph.D. degree in Physiology and Biophysics. Further information about this program may be obtained from the Bulletin of the Graduate School of Arts and Sciences.
Fourth-year students meet weekly with Dr. Robert Shank, Danforth Professor and Head of the Department, or other faculty members for seminar discussions.

DEPARTMENT OF PREVENTIVE MEDICINE AND PUBLIC HEALTH

The Department of Preventive Medicine and Public Health offers instruction during the first and second years of the curriculum and provides other learning experience in elective courses in the fourth year. In clinical clerkships of other departments, students also have experience in rehabilitation in the Irene Walter Johnson Institute of Rehabilitation. During the first year a course in statistical methods in medicine is given, which is introductory to the use of statistical procedures in courses of other departments and prepares the student for critical evaluation of reports published in the medical literature. A second-year course is concerned with the epidemiology of disease and the derivation of effective procedures for the prevention and control of disease and disability. Emphasis is given to the opportunities for health promotion and disease prevention in the practice of medicine.
Danforth Professor and Head of the Department

Robert Ely Shank, A.B., Westminster College, 1935; M.D., Washington University, 1939. (See Department of Medicine)

Kountz Professor

Hugh Chaplin, Jr., A.B., Princeton University, 1943; M.D., Columbia University, 1947. (See Department of Medicine and Institute of Rehabilitation)

Professors

Herbert R. Domke (Public Health), S.B., University of Chicago, 1939; M.D., 1942; M.P.H., Harvard University, 1948; D.P.H., 1959. (See Department of Medicine)

C. Howe Eller (Public Health), A.B., Stanford University, 1927; M.D., University of Colorado, 1930; Ph.D., Johns Hopkins University, 1934.

M. Kenton King, B.A., University of Oklahoma, 1947; M.D., Vanderbilt University, 1951. (See Department of Medicine)

Gerald T. Perkoff, M.D., Washington University, 1948. (See Department of Medicine)

Professor and Director of the Division of Biostatistics

Reimut Wette (Biostatistics), M.S., University of Heidelberg, 1952; D.Sc., 1955.

Associate Professors

Albert Eisenstein, A.B., University of Missouri, 1941; M.D., Washington University, 1944. (See Department of Medicine) (Cochran Veterans Administration Hospital)

George R. Morrison (Markle Scholar), B.N.S., Holy Cross College, 1946; A.B., University of Rochester, 1948; M.D., 1954. (See Department of Medicine)

Assistant Professors

Sung C. Choi (Biostatistics), B.S., University of Washington, 1957; M.A., 1960; Ph.D., University of California, 1966.

Julian B. Fleischman (American Heart Association Established Investigator), B.S., Yale University, 1955; Ph.D., Harvard University, 1960. (See Department of Microbiology)

John Holloszy, M.D., Washington University, 1957. (See Department of Medicine)

C. Kirk Osterland (Arthritis Foundation Special Investigator), M.D., University of Manitoba, 1956. (See Department of Medicine)

James C. Peden, Jr., A.B., Haverford College, 1951; M.D., Washington University, 1955. (See Department of Medicine)

Eng M. Tan (Arthritis Foundation Special Investigator), A.B., Johns Hopkins University, 1952; M.D., 1956. (See Department of Medicine) (On leave of absence)

John D. Yavera, B.A., University of Colorado, 1950; M.D., Washington University, 1954. (See Department of Medicine)

M. Frances Watson (Social and Environmental Studies), B.S., Northeast Missouri State Teachers College, 1932; M.S.W., Washington University, 1949.

Assistant Professor (Clinical)

Franz U. Steinberg, M.D., University of Berne, 1938. (See Department of Medicine) (Jewish Hospital)

Instructors

Ruth E. Brennan (Nutrition), B.S., University of Tennessee, 1943; M.S., Simmons College (in affiliation with Harvard School of Public Health), 1945; Sc.D., University of Pittsburgh, 1966.


Barbara Hixon (Biostatistics), B.S., University of Illinois, 1941.

Janelyn M. Mueller (Occupational Therapy and Rehabilitation), B.S., Washington University, 1959.

Patricia Picket (Nursing and Rehabilitation), B.S.N., Western Reserve University, 1959.

Anne Brown Short (Physical Therapy and Rehabilitation), B.S., Washington University, 1931.
Research Instructors

Howard A. Bomze (Rehabilitation Biomedical Engineering), B.S.E.E., Drexel Institute of Technology, 1966; M.S.Bm.E., 1968. (Effective July 15, 1968)

Chuan Huan Cheng, B.S., China National Central University, 1944; M.S., Cornell University, 1950; Ph.D., Michigan State University, 1955.

Estelle Kochavi (Biostatistics), A.B., Washington University, 1960; M.S., University of Wisconsin, 1963.

Kaare Julian Lindqvist (Immunology), D.V.M., Veterinary College, Norway, 1953; M.S., Michigan State University, 1957; Ph.D., Indiana University Medical Center, 1967.

Lecturers

Harry L. Acker (Physical Medicine and Rehabilitation), B.S., Clemson College, 1940; M.D., Medical College of South Carolina, 1950.

Richard A. Sutter (Industrial Medicine and Rehabilitation), A.B., Washington University, 1931; M.D., 1935.

Research Assistant

Mary B. Koch, A.B., Miami University, 1936.

FIRST YEAR

Biomedical Statistics. This course is an introduction to the principles and methods of biostatistics. It emphasizes the concepts of statistical methodology as being essential to proper application and interpretation of statistical methods. Elementary statistical techniques illustrating the use of statistical principles in experimentation and clinical research are discussed. Second semester.

(Res. Wette and Staff, Division of Biostatistics)

SECOND YEAR

Epidemiology and Prevention of Disease. This is a lecture course which describes the patterns of occurrence and the distribution of selected diseases in populations. It is concerned with the variety of characteristics of host, agent, and environment which determine the occurrence of specific disorders. Procedures which may be utilized to prevent or interrupt the course of disease and disability are described and evaluated.

(Res. Shank and Staff)

FOURTH YEAR

SEMINAR ELECTIVES

Statistical Methods in Experimental and Clinical Medicine. This course involves lectures, seminars, and laboratory experience to enhance the competence of students in the selection and application of biostatistical procedures for purposes of experimental and clinical investigation.

(Res. Wette and Staff, Division of Biostatistics)

Clinical Immunology. This course, through lectures and seminars, provides opportunity for broadening the knowledge and experience of students in fields of clinical immunology. The material covered includes immunization, immune deficiency states, immunological diseases, cellular hypersensitivity, complement in human disease, and cancer immunology.

(Res. Osterland, Chaplin, J. Smith, C. W. Parker, Lindqvist, McGuigan)
Clinical Nutrition. This series of seminars is concerned with nutrient requirements, metabolic roles of nutrients, modification of nutrient requirements by disease, deficiency disorders, obesity, hypervitaminoses, and the role of diet in the occurrence or treatment of various diseases. (Drs. Shank, Eisenstein, Morrison, Holloszy, Brennan)

RESEARCH ELECTIVES

Arthritis and Connective Tissue Disease. Opportunity is afforded to participate in laboratory and clinical studies of the arthritides, dysproteinemias, and other connective tissue disorders exhibiting auto-immune phenomena. (Drs. Osterland, Fleischman, Lindqvist)

Biochemistry of Exercise. Includes laboratory and clinical investigation of the changes in muscle and other tissues, with the objective of determining the role of exercise in the prevention and rehabilitation of disease. (Dr. Holloszy)

Biostatistics. Research experience is offered in the application of statistical, mathematical, and computer methodology for experimental and clinical research problems. (Drs. Wette and Choi)

Blood Coagulation. The student is afforded opportunity to participate in clinical and biochemical investigations of normal processes of coagulation of blood and hereditary and acquired defects of the clotting system. (Dr. Peden)

Clinical and Experimental Nutrition. The student participates in laboratory studies of the influence of various nutrients on enzyme activity in liver and other tissues and in clinical evaluation of nutritional status of selected patients. Opportunities are available to selected students to study and observe major problems of deficiency disease in other countries. (Drs. Shank, Morrison, Eisenstein, Holloszy, Cheng)

Immunohematology. Included are opportunities to gain experience in the application of serologic and immunochromic techniques in basic investigations of erythrocyte auto-antibodies and iso-antibodies encountered in hemolytic diseases of the newborn, leukemias, lymphomas, malignacies and connective tissue disorders. (Dr. Chaplin)
DEPARTMENT OF PSYCHIATRY

Instruction in psychiatry is given in all four years of the medical course. In the first half of the first year a course is given which is basic to the understanding of human behavior. Major emphasis is given to a presentation of psychological research in the field of early development, learning, emotion, and similar topics.

In the second year, the student is introduced to psychiatric interviewing, to the evaluation of emotional and behavioral symptoms, to clinical psychiatric disorders, their diagnosis and natural history, and to the conceptual problems involved in psychiatry and psychology. These subjects are taken up in lectures, demonstration interviews, and discussion. The emphasis is upon critical thinking, the evaluation of data, and the methodologic problems arising in the study of behavioral, emotional, and thinking disturbances.
In the third year, supervised clinical study of patients admitted to the Renard, Bliss, and St. Louis Children's Hospitals is emphasized. An introduction is given to various therapeutic procedures in psychiatry.

In the fourth year, psychiatric teaching is part of the elective curriculum, including clinical clerkships in the outpatient department, full-time research, and other possible instructional settings.

Wallace Renard Professor and Head of Department
Eli Robins, A.B., Rice University, 1940; M.D., Harvard University, 1943.

Wallace Renard Professor Emeritus
Edwin Francis Gildea, A.B., Colorado College, 1920; M.D., Harvard University, 1924.

Professors
Samuel B. Guze, M.D., Washington University, 1945. (See Department of Medicine)
Lee N. Robins (Sociology), A.B., Radcliffe College, 1942; M.A., 1943; Ph.D., 1951.
Saul Rosenzweig (Medical Psychology), A.B., Harvard University, 1929; M.A., 1930; Ph.D., 1932. (Also Department of Psychology)
John A. Stern (Psychology), A.B., Hunter College, 1949; M.S., University of Illinois, 1951; Ph.D., 1953. (Also Department of Psychology)
George Winokur, A.B., Johns Hopkins University, 1944; M.D., University of Maryland, 1947.

Blanche Itleson Professor of Child Psychiatry

Associate Professors
Blake W. Moore (Biochemistry), B.S., University of Akron, 1948; Ph.D., Northwestern University, 1952.
George E. Murphy, B.S., Oregon State College, 1949; M.D., Washington University, 1952.

Patricia L. O'Neal, A.B., Washington University, 1944; M.D., 1948.
Ferris N. Pitts, Jr., A.B., Washington University, 1952; M.D., 1955. (See Department of Pediatrics)
Kathleen Smith, B.S., University of Arkansas, 1944; M.D., Washington University, 1949. (Malcolm Bliss Hospital)
Mark A. Stewart, B.A., M.A., Cambridge University, 1955; M.R.C.S., L.R.C.P., Cambridge and St. Thomas' Hospital, 1956. (See Department of Pediatrics)

Research Associate Professor
David J. Pittman (Sociology), A.B., University of North Carolina, 1949; M.A., 1950; Ph.D., University of Chicago, 1956. (Also Social Science Institute)

Associate Professor (Clinical)
Margaret C.L. Gildea, B.S., University of Chicago, 1923; M.D., Yale University, 1936.

Assistant Professors
Thomas C. Brugger (Child Psychiatry), B.S., University of Wisconsin, 1950; M.D., 1953.
Remi J. Cadoret, M.D., Harvard College, 1949; M.D., Yale University, 1953.
Loretta Cass (Medical Psychology in Child Psychiatry), B.A., Colorado College, 1954; M.A., 1942; Ph.D., Ohio State University, 1950. (Also Department of Psychology)
Stanton P. Fjeld (Medical Psychology), B.A., University of Minnesota, 1950; M.A., University of Missouri, 1954; Ph.D., 1961. (Bliss Hospital)
Marijan Herjanic, M.D., Zagreb University, 1956.
Richard W. Hudgens, M.D., Washington University, 1956.
Lucy J. King, A.B., Washington University, 1934; M.D., 1938.
Ekkehard Othmer (Experimental Psychiatry), Ph.D., University of Hamburg, 1966; M.D., 1967.
Barbara Powell (Medical Psychology), Ph. D., Washington University, 1964. (Bliss Hospital)
Luis H. Schwarz, M.D., Universidad Nacional Autonoma de Mexico, 1955. (Bliss Hospital)
William R. Sherman (Biochemistry), A.B., Columbia University, 1951; Ph.D., University of Illinois, 1955.
Vincente B. Tuason, M.D., University of Santo Tomas, 1955. (Bliss Hospital)
Robert A. Wodruff, Jr., A.B., Harvard University, 1956; M.D., 1960.
Assistant Professor Emeritus
Lucile Healy (Social Work), A.B., College of St. Catherine, 1922; M.A., University of Minnesota, 1927; M.S.W., Washington University, 1949.
Assistant Professors (Clinical)
Nathan Blackman, B.S., University of Rhode Island, 1929; M.D., University of Paris, 1936.
Robert D. Brookes, A.B., DePauw University, 1934; M.D., Washington University, 1938.
Anthony K. Busch, M.D., St. Louis University, 1937.
Hyman H. Fingert, B.A., State University of Iowa, 1931; M.D., 1934.
James N. Haddock, A.B., University of Missouri, 1940; M.A., 1942; M.D., Washington University, 1943.
Leopold Hofstatter, M.D., University of Vienna, 1926.
Alex H. Kaplan, B.S., College of City of New York, 1932; M.D., St. Louis University, 1936.
Wanda M. Lamb, B.S., University of Missouri, 1946; M.D., Washington University, 1948.
Roy M. Mendelsohn (Child Psychiatry), B.S., University of Illinois, 1950; M.D., 1952.
Paul H. Painter (Child Psychiatry), M.D., St. Louis University, 1947. (See Department of Pediatrics)
Frank O. Shobe, A.B., Washington University, 1938; M.D., 1942.
Assistant Professor Emeritus (Clinical)
Val B. Satterfield, B.S., Washington University, 1922; M.D., 1924.
Instructors
Anna K. Bradley (Social Work), B.J., University of Missouri, 1956; M.S.W., Washington University, 1958. (Bliss Hospital)
Patricia J. Brilliant (Medical Psychology), A.B., Washington University, 1961; M.A., 1962; Ph.D., 1966. (Bliss Hospital)
Luci B. Calvin, B.Ed., Illinois State Normal University, 1942; M.D., Meharry Medical College, 1951. (Bliss Hospital)
Marguerite Cannon (Social Work), B.S., St. Louis University, 1936; M.S.W., Washington University, 1948.
Gabrielle Casebier (Speech Correction in Child Psychiatry), B.S., University of Illinois, 1942; M.A., 1942; Ph.D., University of Wisconsin, 1959.
Alan G. Craig, M.D., (M.B., Ch.B.), Aberdeen University, 1951.
Alexandro M. Datuin, M.D., University of Santo Tomas, 1956. (Bliss Hospital)
Plaridel C. Deza, M.D., University of Santo Tomas, 1956. (Bliss Hospital)
Donald S. Goodwin, A.B., Baker University, 1953; M.D., Kansas University, 1964.
Mary Grobmann, M.S., St. Louis University, 1959; Ph.D., 1965.
Julian C. Hall (Social Work), B.S., University of Louisville, 1949; M.S., 1951. (Bliss Hospital)
Barbara Moss Herjanic, University, 1943; B.S., Western Michigan College, 1946; M.D., University of Michigan, 1950. (Bliss Hospital)
Priscilla Liang Hsu (Social Work—Child Psychiatry), B.A., Tunghai University, 1960; M.S.W., University of Hawaii, 1963.
Felix E. Larocca, M.D., University of Santo Domingo, 1950. (Bliss Hospital)
John W. Olney, B.A., State University of Iowa, 1956; M.D., 1963.
Isa A. Samad, M.B., B.S., Patna University, 1946. (Bliss Hospital)
Elizabeth M. Smith (Social Work), B.A., University of Nebraska, 1960; M.S.W., 1962.
Eve May Spinney (Social Work in Child Psychiatry), B.A., University of Kentucky, 1957; M.S.W., St. Louis University, 1964.
Robert H. Vanderpearl, A.B., Washington University, 1951; M.D., 1956. (Bliss Hospital)

Instructor Emeritus and Lecturer
Louetta Berger (Social Work in Child Psychiatry), B.S., University of Wichita, 1941; M.S.W., Washington University, 1946.

Research Instructors
Robert Goldstein (Medical Psychology), B.A., City College of New York, 1954; Ph.D., University of Illinois, 1962. (Also Department of Psychology)
Boaz Kahana (Medical Psychology in Child Psychiatry), B.A., Yeshiva University, 1953; M.S., 1957; Ph.D., University of Chicago, 1968. (Also Department of Psychology)

Instructors (Clinical)
John M. Anderson, B.S., Colorado State University, 1938; M.D., Meharry Medical College, 1958. (Bliss Hospital)
Libby G. Bass (Medical Psychology), B.A., University of Illinois, 1928; M.A., Northwestern University, 1929.
Robert M. Bell, M.D., St. Louis University, 1928.
William Cone, B.A., Yale University, 1949; M.D., 1954.
Edmund V. Cowdry, Jr., A.B., Princeton University, 1942; M.D., Washington University, 1945.
Mary E. Cox, A.B., Washington University, 1941; M.D., 1944.
Lois E. Franklin (Medical Psychology in Child Psychology), B.A., Blackburn College; M.A., MacMurray College, 1952.
Wilbur H. Gearhart, B.S., Butler University, 1949; M.D., Hahnemann Medical College, 1950.
Doris C. Gilpin (Child Psychiatry), M.D., University of Chicago, 1948.
Janet Golden (Social Work), A.B., Washington University, 1924.
Douglas R. Gowler (Child Psychiatry), M.D., Manitoba College, 1957.
Arthur S. Greditzer, M.D., Washington University, 1948. (On leave of absence)
Robert S. Hicks, A.B., Hendrix College, 1951; M.D., University of Arkansas, 1958.
Lilli Hofstatter, M.D., University of Vienna, 1949.
THE SCHOOL OF MEDICINE

Joseph B. Kendis (Clinical Medicine), M.D., Washington University, 1933.
Edward H. Kowert, A.B., Washington University, 1940; M.D., 1943.
John B. Lewis (Medical Psychology in Child Psychiatry), B.S., Northwestern University, 1949; M.S.W., Washington University, 1952.
John H. McMahan, A.B., Southeast Missouri State Teachers College, 1939; M.D., St. Louis University, 1943.
Jay Meyer, A.B., Washington University, 1956; M.D., St. Louis University, 1960. (On leave of absence)
Saul Niedorf (Child Psychiatry), B.A., University of California, 1952; C.S.W., 1953; M.D., University of Geneva, 1959.
Reese H. Potter, A.B., University of Kansas, 1931; B.S., University of Missouri, 1933; M.D., Washington University, 1935.
Edith C. Robinson (Child Psychiatry), A.B., Randolph-Macon College, 1927; M.S., University of South Carolina, 1928; M.D., Johns Hopkins University, 1932. (See Department of Pediatrics)
Earl R. Schultz, A.B., Southeast Missouri State College, 1952; B.S., University of Missouri, 1953; M.D., Washington University, 1955. (See Department of Neurology)
Nathan M. Simon, M.S., Yale University, 1950; M.D., Washington University, 1955.
Alberto Soto, M.D., Salamanca University, 1959. (Bliss Hospital)
Harold D. Wolff, A.B., Washington University, 1952; B.S., University of Missouri, 1953; M.D., State University of Iowa, 1955.

Instructor Emeritus (Clinical)
Barbara S. Kendall (Medical Psychology), A.B., Radcliffe College, 1913; Ed.M., Harvard University, 1928.

Consultant

Assistants
Donna L. Evert (Education in Child Psychiatry), B.S., Kansas State University, 1966.
Marilyn Shapiro (Social Work in Child Psychiatry), B.A., Newcomb College, 1963; M.S.W., Tulane University, 1965.

Research Assistants
Jeannine Andrews (Medical Psychology), B.S., Washington University, 1954.
Jose Apelbaum (Biochemistry), M.D., University of Buenos Aires, 1955.
Barbara A. Bahn, B.S., Maryville College, 1967.
David A. Bremer (Medical Psychology), B.A., Trinity College, 1967.
Sally L. Goodwin (Biochemistry), B.S., St. Mary's of Notre Dame, 1953.
William H. Holland (Biochemistry), A.B., Washington University, 1950.
Babette Laibovitz (Biochemistry), A.B., Washington University, 1968.
SECOND YEAR

The Pathology of Behavior. Emphasis is upon (a) effective interviewing in preparation for medical history taking, (b) evaluation of behavioral and emotional factors in patients with various kinds of illnesses, (c) the diagnosis and natural history of the major psychiatric disorders, (d) critical evaluation of conceptual and methodologic problems in psychiatry and psychology. Lectures, demonstration interviews, discussions.

(Dr. Murphy and Associates)

THIRD YEAR

Students in groups of about ten spend six weeks full time on the inpatient services of Renard and Bliss Hospitals.

(Drs. E. Robins, Woodruff, and Associates)

FOURTH-YEAR ELECTIVE COURSES

Outpatient Adult and Child Psychiatry. This course is intended to provide instruction and experience in the evaluation and treatment of both adult and child psychiatry clinic patients, and to increase knowledge about community resources dealing with these patients.

(Drs. Stewart, Hudgens, and Associates)

Selected Topics in Psychiatric Research. Students may elect to work full time in psychiatric research at any time during their elective year. Twelve weeks will be the minimum time allowed; no maximum time is specified. Arrangements will be made on an individual basis with the appropriate investigators.

(Drs. Clayton, Guze, Larocca, Murphy, Pitts, Stewart, Smith, Tuason, Winokur, Woodruff, King, B. Moore)
Child Psychiatry. This course will meet once a week for formal lectures followed by group discussions. Twelve sessions are scheduled as follows: History of Child Psychiatry; Specific Diagnosis and General Principles of Management; Theory of Child Development A; Hyperactive Children; Theory of Child Development B; Autism; Examination of Children with Psychiatric Problems A; School Phobia, Fears, and Depression; Examination of Children with Psychiatric Problems B; Retardation, and Reading Disability; Treatments in Child Psychiatry; Accident Proneness (Fire Setting, Stealing). (Drs. Larocca and Stewart)

Neurochemistry. This course will be given jointly by the Departments of Psychiatry and Pharmacology. Topics covered include carbohydrates; energy metabolism, including changes found in different functional states; amino acid metabolism and its relation to protein and transmitter synthesis; special proteins and protein metabolism; cerebral lipids, membranes, and normal and disordered lipid metabolism; transmitters and modulators; learning; growth, development, and trophic functions; cerebral blood flow, blood brain barrier. (Drs. McDougal and B. Moore)

Research in Psychology and Psychiatry. Facilities are available for qualified students to undertake original research in the laboratories of the department or in the clinics or wards. (Dr. E. Robins)

Staff Conferences. Students are invited to attend certain of the psychiatric staff conferences held weekly at Bliss Institute.

Psychoanalysis. Introduction to psychoanalysis is presented at weekly seminars lasting one trimester. Some didactic material is given, but most of the session is devoted to discussion. (Drs. Fingert, Kaplan, Sommer)
DEPARTMENT OF RADIOLOGY

For the convenience of administration, teaching, and research, the Department of Radiology is divided into divisions and sections under the following directors:

Diagnostic Radiology
   Abdominal Radiology ......................... Dr. Ruben Koehler
   Musculoskeletal and Peripheral Angiography .......... Dr. Tom W. Staple
   Neuroradiology ......................... Dr. David O. Davis
   Pediatric Radiology .................. Dr. William McAlister

Medical Ultrasound .................. Dr. Ray A. Brinker
Therapeutic Radiology ................. Dr. William E. Powers
Radiation Biology .................. Dr. Leonard J. Tolmach
Radiation Physics .................. Dr. Michel Ter-Pogossian
Nuclear Medicine .................. Dr. James Potchen
The Department of Radiology of Washington University is housed in the Edward Mallinckrodt Institute of Radiology and connects by corridor or tunnel with all of the hospitals and clinics constituting the Medical Center. The Department provides both diagnostic and therapeutic radiological services for the patients of Barnes, St. Louis Children’s, St. Louis Maternity, McMillan, Wohl, Barnard, and Renard Hospitals, Washington University Clinics, and the Queeny Tower. In addition, laboratory facilities for research in radiation physics, radiation biology, radiation therapy, and ultrasound are housed in the Institute.

Four floors of the Institute building are devoted to diagnostic roentgenographic facilities. The first floor houses administrative and business offices, film library, and consultation viewing rooms. A book and journal library and a conference room are located on the eighth floor. The radiation therapy division is located on the ground floor of the Institute and in Barnard Hospital. Its facilities include low and high voltage X-ray, cobalt, and a 24 Mev. betatron in addition to radium and other radioactive isotope therapy. Two floors of the Institute provide research laboratories for the staff and experimental diagnostic and therapeutic service for other departments of the School. The radiation physics and the nuclear medicine divisions have the most up-to-date equipment for radiation detection and scanning, as well as a cyclotron used to produce short-lived isotopes for research. A medical ultrasound laboratory for research and clinical application is located on the sixth floor of the Institute. A well staffed radiation biology laboratory is located on the sixth floor.

The undergraduate teaching program is designed to present both diagnostic and therapeutic radiology to students as part of their clinical clerkship experience. Every effort is made to provide an opportunity to correlate roentgen and clinical findings through interdepartmental conferences, consultations, and group discussions.

**Professor and Head of the Department and Director of the Mallinckrodt Institute of Radiology**

Juan M. Taveras, B.S., Normal School of Santiago, Dominican Republic, 1937; M.D., University of Santo Domingo, 1943; M.D., University of Pennsylvania, 1949. (See Department of Anatomy)

**Professors**

William H. McAlister, B.S., Wayne State University, 1950; M.D., 1954.

William E. Powers, B.S., University of Illinois, 1949; M.D., 1951. (See Department of Surgery)

Michel M. Ter-Pogossian (Radiation Physics), B.A., University of Paris, 1942; M.S., Washington University, 1948; Ph.D., 1950. (See Department of Physiology and Biophysics)

Leonard J. Tolmach (Radiation Biology), B.S., University of Michigan, 1943; Ph.D., University of Chicago, 1951.

**Professor Emeritus**

Hugh Monroe Wilson, A.B., Illinois College, 1924; M.D., Washington University, 1927; M.A. (hon.) Yale University, 1945. (See Department of Anatomy)
Professor (Clinical)


Consultants

Arthur L. Hughes (Physics), B.Sc., Liverpool University, 1906; M.Sc., 1908; D.Sc., 1912; B.A., Cambridge University, 1910.

Rubeny Perez-Tamayo (Radiation Therapy), B.S., National School of Medicine, National University of Mexico, 1945; M.D., 1952.

Edward H. Reinhard (Hematology and Oncology), A.B., Washington University, 1935; M.D., 1939. (See Department of Medicine)

José Sala (Radiation Therapy), B.S., Colegio Nacional (Argentina), 1936; M.D., Universidad del Litoral (Argentina), 1944. (Midwest Radiation Center)

Mildred Trotter (Anatomy), A.B., Mount Holyoke College, 1920; Sc.M., Washington University, 1921; Ph.D., 1924; Sc.D. (hon.), Western College, 1956; Sc.D. (hon.), Mount Holyoke College, 1960. (See Department of Anatomy)


Associate Professors

David O. Davis, B.S., University of Illinois, 1954; M.D., St. Louis University, 1958.

P. Ruben Koehler, M.D., University of Berne (Switzerland), 1956.

Carlos Perez, B.S., University of Antioquia (Colombia), 1952; M.D., 1960.

E. James Potchen, B.S., Michigan State University, 1954; M.D., Wayne State University, 1958.


Associate Professor (Clinical)

A. Norman Arneson, B.S., Texas Christian University, 1924; M.D., Washington University, 1928. (See Department of Obstetrics and Gynecology)

Assistant Professors

Ray A. Brinker, B.A., State University of Iowa, 1954; M.D., 1957.

Tom L. Gallagher (Computer Science), B.A., North Texas State College, 1953; M.S., 1954; D.Sc., Washington University School of Medicine, 1967. (Also Computer Facilities)

Tom W. Staple, B.S., University of Illinois, 1953; M.D., 1955.


Assistant Professors (Clinical)

Mark D. Eagleton, Jr., A.B., Amherst College, 1947; M.D., Washington University, 1950.

Sumner Holtz, M.D., St. Louis University, 1948.

Douglas R. Lilly, A.B., Princeton University, 1952; M.D., Washington University, 1956. (See Department of Internal Medicine)

Hyman R. Senturia, A.B., Washington University, 1929; M.D., 1933.

Wayne A. Simril, A.B., Culver-Stockton College, 1941; M.D., Washington University, 1944.

Assistant Professor Emeritus (Clinical)

Oscar C. Zink, M.D., Washington University, 1921.

Research Assistant Professors

Ellen G. Archer (Nuclear Medicine), B.S., Chatham College, 1950; M.S., University of Arkansas, 1956; Ph.D., 1965.

Robert M. Hochmuth, B.S., University of Colorado, 1961; Ohio State University, 1962; Ph.D., Brown University, 1967. (Also Chemical Engineering)

Hywel Madoc-Jones (Radiation Biology), B.A., Oxford University, 1960; Ph.D., University of London, 1965.

Instructors

James W. Debnam, Jr., B.A., University of Louisville, 1938; M.D., 1962.
John O. Eichling (Radiation Physics), B.S., Northeastern Oklahoma State College, 1958; M.S., Oklahoma State University, 1959.
Patricia Ann Farih (Radiologic Technology), B.S., St. Louis University, 1966.
Joseph M. Gilson (NINDB Special Fellow, Neuroradiology), B.S., St. Louis University, 1958; M.D., University of Minnesota Medical College, 1962.
Kwang Soo Kim, (NINDB Special Fellow, Neuroradiology), M.D., Severance Medical College (Seoul, Korea), 1957.
Emilio Torres-Reyes, (NINDB Special Fellow, Neuroradiology), B.S., University of Puerto Rico, 1956; M.D., 1960.
Peter E. Weinberg, (NINDB Special Fellow, Neuroradiology), B.S., University of Wisconsin, 1958; M.D., 1961.

Instructor (Clinical)


Noah Susman, A.B., Washington University, 1948; M.D., 1952. (Jewish Hospital)

Research Instructor


Lecturers

Jean L. Tomlinson (Radiologic Technology).

Research Assistants

Margaret Ann Cummings, A.B., University of Pennsylvania, 1951.
Julius Hecht, A.B., Washington University, 1950.
Suzanne Madoc-Jones, B.S., Loyola University, 1958.
Judith Olson, R.N., Barnes Hospital School of Nursing, 1965.
James H. Patterson, B.A., Lincoln University, 1955.
Kaye E. Shumate, B.S., Washington University, 1953.
Margaret J. Skelton, B.S., University of Georgia, 1963.
James L. Smith.
Rebecca K. Studer, B.S., State Teachers College (Kirksville), 1964; M.S., Texas Christian University, 1966.

SECOND YEAR

Eighteen hours of lecture devoted to diagnosis.
Eighteen hours of lecture devoted to radiation physics, radiation biology, radiation therapy, and nuclear medicine.

Electives

Research Electives. Opportunity is available to carry out research in the laboratories under the guidance of the staff in the fields of diagnostic radiology, therapeutic radiology, radiation physics, nuclear medicine, radiation biology, and medical ultrasound.
**Nuclear Medicine.** A series of 24 lectures emphasizing the principles of the tracer method as applied to clinical medicine. The material will include means of obtaining and interpreting kinetic data and the application of such data to the pathophysiologic assessment of specific disease states. Emphasis will be placed on the current status of radioisotopes in evaluating normal and pathologic clinical physiology as a transition between basic sciences and clinical medicine.

*Radiation Physics.* Will be offered in fall, 1969.

*Radiation Biology.* Will be offered in fall, 1969.

Fourth-Year Elective Courses

**Clerkships in Radiology.** Clinical rotations and formal teaching sessions offering a broad introduction to the role of radiology in clinical diagnosis and therapy. Six weeks. The clinical rotation will consist of three to four hours each day with a staff radiologist examining patients and evaluating the radiologic approach to specific disease problems. These sessions include an introduction to the principles of film interpretation and the opportunity to observe fluoroscopy and special procedures. Therapy sessions will include case presentation and clinical oncology. Each student's clinical rotation will be customized and vary with his needs and interest. The formal teaching sessions, however, will be more rigidly structured.

**Clerkships in Subspecialties of Radiology.** These clerkships are offered in nuclear medicine, radiation therapy, medical ultrasound, and the various subspecialties of diagnostic radiology. (Drs. Koehler, Davis, McAlister, Powers, Potchen, Brinker)

*Nuclear Medicine* (see above).

*Radiation Physics* (see above).

*Radiation Biology* (see above).
The teaching of rehabilitation is conducted for third- and fourth-year medical students by the Department of Preventive Medicine in collaboration with various specialty services. The Irene Walter Johnson Institute of Rehabilitation is a modern, two-story facility that is air-conditioned and well equipped for the care of disabled patients. Students of medicine, house officers, and students of paramedical services have an opportunity to affiliate with the Institute.

**Director**
Hugh Chaplin, Jr., A.B., Princeton University, 1943; M.D., Columbia University, 1947. (See Departments of Medicine and Preventive Medicine and Public Health)

**Associate Medical Director**
John O. Holloszy, M.D., Washington University, 1950; M.A., 1954; Ph.D., 1962. (See Departments of Anatomy and Physical Therapy)

**Traineeship Elective.** Traineeships in Physical Disability and Rehabilitation of eight weeks' duration may be elected during the interval between the end of the spring semester and beginning of the fall semester by up to five students who have completed
the first year of the Medical School curriculum. Specific instruction will be given by means of informal lectures, demonstrations, and seminars.

*Elective in Physical Disability and Rehabilitation.* The student will become familiar at first hand with the techniques for defining the extent of physical disability and with various approaches to its treatment. Emphasis will be placed on methods used in physical, occupational, and speech therapy, and on the specialized contributions to be made by rehabilitation, social work, nursing, and vocational testing and counseling.

(Drs. Chaplin, Holloszy)
Dr. Walter Ballinger performs an operation assisted by members of the resident staff.

THE MARY CULVER DEPARTMENT OF SURGERY

The Department of Surgery includes General Surgery, Plastic and Reconstructive Surgery, Orthopedic Surgery, Neurological Surgery, Genitourinary Surgery, Cardiac Surgery, and Anesthesiology.

The instruction begins with an introduction to surgical principles in the second year. These surgical principles for the most part are derived from fundamental concepts in the preclinical sciences which have been occupying the student since the beginning of the freshman year. Although in this course a few patients are used for the demonstration of lesions which illustrate the principles of surgery, it is in the junior year that the first personal contact with patients occurs. Students in the third year are assigned to general surgical clinical clerkships in the hospitals, where they have an opportunity to study the frequent and important surgical diseases.

The junior general surgical clerkship, lasting twelve weeks, is spent on the general surgical services of the hospitals in the medical center. Students attend patient rounds.
with residents and staff daily during the clerkship and attend seminars conducted by the
general and specialty surgical staffs. Students are encouraged, but are not required, to
attend and assist at operations upon patients assigned to them. The physiology, pathology,
chemistry, and bacteriology of pre-operative and postoperative care are stressed. Experi-
ence is acquired in surgical diagnosis and in the scientific methods available to clinicians
that permit them to assess the effectiveness of what they do.

The fourth-year surgical program permits the senior student to select any of the
following types of electives for periods of six to eighteen weeks: (1) preceptorships
in which the student is assigned to a staff member for instruction and exposure to the
problems of clinical practice, (2) surgical research under supervision (minimum time
d twelve weeks), (3) electives in anesthesiology, pediatric surgery, thoracic and cardiac
surgery, plastic and reconstructive surgery, orthopedics, neurosurgery, urology, and
oncology.

Bixby Professor of Surgery and
Head of the Department
Walter F. Ballinger II, M.D., University

Henry E. Mallinckrodt Professor of
Anesthesiology and Chief of the
Division of Anesthesiology
Robert B. Dodd, M.D., University of Ne-
braska, 1945.

Harry Edison Professor of Surgery
Arthur E. Baue, A.B., Westminster College,
1950; M.D., Harvard Medical School, 1954.

Professors
Harvey R. Butcher, Jr., A.B., Central Col-
lege, 1941; M.D., Harvard University, 1944.
Justin J. Cordonnier, B.S., Washington Uni-
versity, 1926; M.D., 1928. (Genitourinary
Surgery)
Sidney Goldring, M.D., Washington Uni-
versity, 1947. (Neurological Surgery)
Fred C. Reynolds, A.B., Washington Uni-
versity, 1931; M.D., 1934. (Orthopedic Sur-
gery)
Henry G. Schwartz, A.B., Princeton Uni-
versity, 1928; M.D., Johns Hopkins Univer-
sity, 1932. (Neurological Surgery)

Research Professor
Albert Roos, M.D., University of Groning-
en (Holland), 1940. (Anesthesiology) (See
Department of Physiology and Biophysics)

Professors (Clinical)
Eugene Myron Bricker, M.D., Washington
University, 1934.
Thomas H. Burford, A.B., University of Mis-
souri, 1931; B.S.Med., 1933; M.D., Yale
University, 1936.
Louis T. Byars, B.S., University of Arkan-
sas, 1928; M.D., Washington University, 1932.
(Plastic and Reconstructive Surgery)
Minot P. Fryer, A.B., Brown University,
1936; M.D., Johns Hopkins University, 1940.
(Plastic and Reconstructive Surgery)
Leonard T. Furlow, B.S., Emory University,
1923; M.D., 1925. (Neurological Surgery)
(On leave of absence)
H. Relton McCarroll, A.B., Ouachita Col-
lege, 1927; M.D., Washington University,
1931. (Orthopedic Surgery)

Professors Emeriti (Clinical)
James Barrett Brown, M.D., Washington
University, 1923. (Plastic and Reconstructive
Surgery)
Glover H. Copher, A.B., University of Mis-
souri, 1916; M.D., Washington University,
1918.
Dalton K. Rose, M.D., Washington University, 1915. (Genitourinary Surgery)

Lecturer

John S. Spratt, Jr., M.D., Southwestern Medical School of the University of Texas, 1952.

Associate Professors

William S. Coxe, B.S., Hampden-Sydney College, 1945; M.D., Johns Hopkins University, 1948. (Neurological Surgery)
Paul R. Hackett, B.A., Denison University, 1945; M.D., Western Reserve University, 1949. (Anesthesiology)
John E. Hoopes, A.B., Rice University, 1953; M.D., Johns Hopkins University, 1957. (Plastic and Reconstructive Surgery)
William T. Newton, B.S., Yale University, 1947; M.D., 1950.
William E. Powers, B.S., University of Illinois, 1949; M.D., 1951. (Radiation Therapy) (See Department of Radiology)
Jessie L. Ternberg, A.B., Grinnell College, 1946; Ph.D., University of Texas, 1950; M.D., Washington University, 1953.
Clarence S. Weldon (Markle Scholar), A.B., University of Michigan, 1951; M.D., Johns Hopkins University, 1955. (Cardiac Surgery)

Associate Professors (Clinical)

Morris Abrams, B.S., University of Illinois, 1934; M.D., 1937. (Genitourinary Surgery)
Robert Wilson Bartlett, B.S., University of Michigan, 1926; M.D., 1930.
Thomas B. Ferguson, B.S., Duke University, 1943; M.D., 1947.
Heinz Haffner, B.S., University of Arizona, 1931; M.D., Washington University, 1935.
Falls B. Hershey, B.S., University of Illinois, 1939; M.D., Harvard University, 1943.
Carl E. Lischer, A.B., University of California, 1933; M.D., Washington University, 1937.
C. Alan McAfee, B.S., Washington State College, 1938; M.D., Washington University, 1942.

Frank McDowell, A.B., Drury College, 1932; M.D., Washington University, 1936. (Plastic and Reconstructive Surgery) (On leave of absence)
Arthur H. Stein, Jr., A.B., Amherst College, 1946; M.D., Washington University, 1948. (Orthopedic Surgery)
James M. Stokes, M.D., Washington University, 1948.
Carl A. Wattenburg, A.B., University of Kansas, 1934; M.D., 1937. (Genitourinary Surgery)

Associate Professors Emeriti (Clinical)

Clarence H. Crego, Jr., B.S., Union University, 1921; M.D., University of Michigan, 1923. (Orthopedic Surgery)
Rogers Deakin, M.D., Washington University, 1922. (Genitourinary Surgery)
J. G. Probstein, M.D., Loyola University, 1917.

Assistant Professors

Donald J. Dickler, B.A., New York University, 1942; M.D., New York University College of Medicine, 1945. (Anesthesiology)
Bela I. Hatfalvi, M.D., M. Kir, Tisza Istvan Tudomanyegyetem (Hungary), 1938. (Anesthesiology)
Robert N. Miller, B.A., University of Missouri, 1957; M.D., 1961. (Anesthesiology)
Andrew D. Spencer, A.B., Indiana University, 1951; M.D., 1954.
Lewis J. Thomas, S.B., Haverford College, 1953; M.D., Washington University, 1957. (Anesthesiology)
Glenn R. Weygandt, M.D., Washington University, 1947. (Anesthesiology)
Granville J. Womack, B.S., Oklahoma City University, 1949; M.D., University of Oklahoma, 1952. (McDonnell Douglas Corporation)
Assistant Professors (Clinical)

William T. Bowles, M.D., Stanford University, 1955. (Genitourinary Surgery)
Cyril J. Costello, B.S., University of Texas, 1935; M.D., 1939.
Oscar P. Hampton, Jr., M.D., University of Tennessee, 1928. (Orthopedic Surgery)
James O. Lottes, Ph.B., St. Louis College of Pharmacy, 1926; Ph.G., 1928; A.B., University of Missouri, 1934; B.S., 1935; M.D., University of Louisville, 1937. (Orthopedic Surgery)
Harry C. Morgan, B.A., University of Missouri, 1949; B.S., 1951; M.D., Harvard University, 1953. (Orthopedic Surgery)
Lawrence W. O'Neal, M.D., Washington University, 1946.
Robert K. Royce, B.S., University of Mississippi, 1939; M.D., Washington University, 1942. (Genitourinary Surgery)
Leo A. Sachar, A.B., Washington University, 1936; M.D., 1940.

Consultant
Lenny W. Peterson, D.D.S., University of Michigan, 1940. (Oral Surgery)

Instructors
Virginia M. Badger, B.A., Occidental College, 1950; M.S., University of Southern California, 1957; M.D., Woman's Medical College of Pennsylvania, 1961. (Orthopedic Surgery)

Henry Casson, M.D., Liverpool University Medical School, 1959. (Anesthesiology)
Alberto de Jesus, B.S., Universidad Autonoma de Guadalajara, 1955; M.D., Universidad Nacional de Mexico, 1959. (Anesthesiology)
Burl M. Dillard, M.D., University of Texas, Southwestern Medical School, 1938.
Robert C. Donaldson, A.B., University of Missouri, 1941; M.D., Washington University, 1944.
Farid M. Fuleihan, B.S., American University of Beirut, 1957; M.D., 1961. (Genitourinary Surgery)
Marcy A. Goldstein, M.D., Washington University, 1951.
Robert B. Holloway, B.S., LeMoyne College, 1952; M.D., Meharry Medical College, 1956. (Anesthesiology)
Gary N. F. Hughes, M.D., University of Manitoba, 1960. (Orthopedic Surgery)
Charles B. Manley, Jr., A.B., University of Missouri, 1955; M.D., 1958. (Genitourinary Surgery)
Eugene N. Mitchell, B.S., St. Louis University, 1955; M.D., University of Missouri, 1960.
Gordon W. Philpott, B.S., Yale University, 1957; M.D., Washington University, 1961.
William Shieber, M.D., Washington University, 1953.
Paul E. Stohr, M.D., Washington University, 1959. (Neurological Surgery) (On leave of absence)
Irvin C. Susman, M.D., University of Illinois, 1949. (Anesthesiology)
Charles L. Witte, A.B., Columbia University, 1956; M.D., New York University School of Medicine, 1960.

Research Instructor

Paul V. Belkin, D.V.M., Vienna Veterinary College, 1944. (Experimental Surgery)

Instructors (Clinical)

Robert Anschuetz, M.D., Washington University, 1940.

Sedat Mehmet Ayata, B.S., Istanbul Lyceum, 1949; M.D., University of Istanbul, 1955. (Anesthesiology)

J. Byron Beare, B.S., St. Louis University, 1936; M.D., 1939; M.S., University of Minnesota, 1947. (Genitourinary Surgery)

Vilray P. Blair, Jr., M.D., Washington University, 1939. (Orthopedic Surgery)

Richard V. Bradley, M.D., Washington University, 1952.

M. Richard Carlin, B.A., Dartmouth College, 1944; M.D., Yale University, 1947. (Genitourinary Surgery)

William S. Costen, A.B., Princeton University, 1950; M.D., Washington University, 1954. (Orthopedic Surgery)

Arthur R. Dalton, B.S., University of Missouri, 1938; B.S.Med., Northwestern University, 1940; M.D., 1941.

Francis G. Duffy, M.B., B.Ch., B.A.O., University College of Dublin, 1951. (Anesthesiology)

Clarence Eckert, M.D., St. Louis University, 1927.

Virgil O. Fish, M.D., Washington University, 1930.

Lee T. Ford, Jr., M.D., University of Tennessee, 1940. (Orthopedic Surgery)

Paul L. Friedman, A.B., Washington University, 1953; M.D., 1957. (Anesthesiology)

Ralph J. Graff, M.D., Washington University, 1957.

Fleming B. Harper, M.D., Medical College of Virginia, 1950.

Ronald C. Hertel, A.B., Washington University, 1952; M.D., 1956. (Orthopedic Surgery)

Edward C. Holscher, A.B., University of Missouri, 1931; B.S., 1933; M.D., Harvard University, 1935. (Orthopedic Surgery)

Saul Klein, M.D., Syracuse University Medical Center, 1959. (Genitourinary Surgery)


W. Edward Lansche, A.B., Washington University, 1948; M.D., 1952. (Orthopedic Surgery)


Stanley M. Leydig, B.A., Montana State University, 1930; M.D., Washington University, 1934. (Orthopedic Surgery)

George E. Lucas, B.S., John Carroll University, 1953; M.D., St. Louis University, 1958. (Anesthesiology)


Marvin Mishkin, M.D., University of Illinois, 1955. (Orthopedic Surgery)

George A. Oliver, A.B., Washington University, 1948; M.D., 1952.

Richard Parsons, B.S., Missouri Valley College, 1954; M.D., Washington University, 1958. (Genitourinary Surgery)

Joseph C. Peden, Jr., B.S., Harvard University, 1940; M.D., 1943.

Mather Pfeiffenberger, Jr., A.B., Yale University, 1941; M.D., Harvard University, 1944.

Daniel W. Platt, M.D., Chicago Medical College, 1949. (Anesthesiology)

Joseph A. Reinkemeyer, M.D., St. Louis University, 1961. (Genitourinary Surgery) (On leave of absence)

Frank O. Richards, A.B., Talladega College, 1944; M.D., Howard University, 1947.

George Scheer, A.B., Municipal University of Wichita, 1940; M.D., Washington University, 1943. (Orthopedic Surgery)

Sam F. Schneider, A.B., Washington University, 1932; M.D., 1936.

William A. Sims, Jr., A.B., University of Missouri, 1954; B.S.Med., 1955; M.D., Washington University, 1957. (Anesthesiology)

Richard G. Sisson, A.B., Harvard University, 1943; M.D., Yale University, 1946.

Herbert Sunshine, A.B., Washington University, 1950; M.D., 1954. (Genitourinary Surgery)
Newton B. White, M.D., University of Cincinnati, 1957. (Orthopedic Surgery)
George H. Zografakis, M.S., Rutgers University, 1955; M.D., State University of New York, Upstate Medical College, 1959. (Plastic and Reconstructive Surgery)

Assistants
James R. Wamsley, A.B., University of Nebraska, 1951; M.S., M.D., 1956; M.P.H., Harvard University, 1960. (McDonnell Douglas Corporation)
George C. Wee, M.D., University of Louisville, 1931.

Assistants (Clinical)
John P. Arnot, B.A., Rice University, 1954; M.D., Yale University, 1958. (Orthopedic Surgery)
Clarence M. Benage, M.D., Washington University, 1958.
Leslie F. Bond, A.B., University of Illinois, 1948; M.D., Meharry Medical College, 1952.
Katherine Jean Crawford, B.S., Michigan State College, 1942; M.D., Woman's Medical College of Pennsylvania, 1946.
James R. Criscione, B.S., Youngstown University, 1943; M.D., St. Louis University, 1951.

SECOND YEAR

Introduction to Surgery. Panel discussions present certain fundamental principles of physiology, biochemistry, and pathology as applied to surgery. Recitations and demonstrations are included. Two hours weekly for eighteen weeks during the second and third trimesters of the second year.

THIRD YEAR

Surgical Clinic. A weekly exercise throughout two trimesters. These clinics serve as a general introduction to the surgical specialties and to anesthesia. (Surgery Staff)

Surgical Wards. For twelve weeks the students serve as clerks in general surgery, working on the wards of the hospitals of the Medical Center. The students take the...
case histories and make the physical examinations and the usual laboratory examinations on the patients assigned to them. They are assigned patients with diseases treated by both surgical specialists and general surgeons. They assist at operations and do some surgical dressings. Surgical pathological material is followed as an integral part of the case study. At regular intervals the students meet with residents and attending staff in informal conferences, when questions which have arisen during the day are discussed and various aspects of the care of the patient considered. They follow their patients after discharge in the postoperative and outpatient clinic. Particular effort is made to see that students have some experience with the more frequent and important surgical lesions, and that the cases assigned to them are sufficiently diversified to afford an accurate perspective of surgery. The student is encouraged to consult the library frequently in the solution of problems concerning his patient. One afternoon a week the student participates in the tumor clinic and attends a tumor conference held jointly by the Departments of Surgery, Pathology, and Radiology. Students may attend the general surgery staff conferences held on Tuesdays at 4:00 p.m. (Surgery Staff)

FOURTH YEAR

The electives offered senior students are principally research type or clerkship periods of study.

Surgical Seminar. An open-end, student-oriented seminar in surgery will be offered to groups of not more than six students. Any number of such groups can be organized if required. Students select the subject and prepare material for discussion in the presence of, but with minimal participation by, the faculty preceptor. One period a week, one to three hours, usually in the evening, in the office or the home of the preceptor. (Dr. Ballinger and Staff)

Surgical Preceptorship Elective. Each student is assigned to one of four or five selected general surgeons. The student will see patients in the physician’s office, take histories, perform physical examinations on the patients, and follow them in the hospital. The student is expected to attend the surgeon’s office hours, operate with him, and make rounds with him. Reading assignments will be evaluated by the surgeon to whom the student is assigned. Projects of a clinical nature may be undertaken during this preceptorship. (Dr. Ballinger and Staff)

Surgical Research Elective. The aim of this elective is to introduce the student to the general approach of analyzing clinical problems of surgery in the laboratory and to familiarize him with some of the investigative methods in surgery. In general, the student will gain more experience by working with an established investigator on a current project. Students are encouraged, however, to plan and execute a laboratory solution to a specific problem within the limitations of his elective time.

The student will participate in the weekly departmental research seminars to hear other investigators describe current laboratory approaches to a wide variety of problems.
and in the weekly surgical journal club to hear varying results of critical reading of current surgical publications, clinical and experimental.

(Drs. Ballinger, Butcher, Collins, Hoopes, Ternberg, Weldon)

**Pediatric Surgery Elective.** This elective consists of a clerkship on pediatric surgery. The emphasis will be on the different problems this age group presents in respect to types of surgical diseases and their care. In addition to the daily ward rounds, conferences will be arranged twice a week to discuss the etiology, diagnosis, and treatment of disorders that have not been encountered on the ward. The student will also attend the General Surgery Pediatric Clinic, where he will participate in postoperative follow-up of patients. Once a week the students will attend the Pediatric Oncology Clinic. Pertinent pediatric X-ray films will be reviewed regularly.

(Dr. Ternberg)

**Principles of Thoracic and Cardiac Surgery.** Designed to present a broad background in surgical disease of the thorax. The student follows his patients through all phases of diagnosis, surgical treatment, and postoperative management. He is at liberty and indeed is encouraged to pursue special areas of interest. For example, a patient with a pulmonary problem may provoke a critical study of pulmonary function testing. A cardiac surgery patient may kindle interests in catheterization techniques, physiology of cardiopulmonary bypass, or a comparative evaluation of surgical methods. There are a number of regularly scheduled conferences and seminars he may attend. In addition, student seminars are held twice weekly for the purpose of discussing pertinent literature, and resolving problems. Each student is asked to select a topic for review at the beginning of the elective, and to present a seminar on his work in the final week.

(Drs. Burford and Weldon)

**Plastic and Reconstructive Surgery Preceptorship.** The aim of this elective is to familiarize the students with some of the problems in plastic and reconstructive surgery. The student will have an opportunity to discuss the applications of principles of tissue repair to a variety of surgical conditions, including burns and other forms of trauma and following major soft tissue cancer surgery. There is a constant personal relationship between the student and the attending staff during the period. (Dr. Hoopes and Staff)

**Orthopedic Surgery Elective.** Clinical clerkship electives are available for six weeks, during which time the student will attend conferences and outpatient clinics and will serve in the various orthopedic clinical divisions. The Orthopedic Service will not have interns, and medical students electing this clerkship will serve as an active and integral part of the team. The conferences that they will be expected to attend consist of:

- X-ray conference, 12:00 to 1:00 p.m., Monday, Tuesday, and Friday.
- Saturday morning conferences at Barnes Hospital and at Shriners Hospital.
- Amputee clinic, Tuesday afternoon.
- Hand conference, 1:00 p.m., Thursday.
- Children's clinic, Wednesday afternoon.

(Dr. Reynolds and Staff)
**Neurosurgery Elective.** The goal is to provide an overview of neurological surgery. Responsibilities will include patient work-up, pre-operative and postoperative care, and attendance at selected neurosurgical operations. Daily morning rounds will be held with a member of the attending staff. At these rounds, a patient is presented and the disease entity discussed in detail. Students will also work in the Neurosurgical Clinic and attend the weekly combined conference in neuropathology, neurology, and neurosurgery. In addition, they will attend the junior class Saturday morning lectures, which include patient presentation.  

(Dr. Schwartz and Staff)

**Elective in Clinical Anesthesia.** This course is designed to demonstrate that the actual administration of an anesthetic is only a part of the total patient care rendered the surgical patient by the anesthesiologist. The general objectives are to teach (1) acute medicine as it is practiced in dealing with the anesthetized patient; (2) the principles of and skill in resuscitation; (3) care of the unconscious patient; (4) practical physiology of respiration; (5) the acute management of fluid, electrolyte, and metabolic disturbances in the surgical patient; (6) the principles of inhalation therapy; (7) the management of pain problems; (8) the interrelationship of various drugs with anesthetic agents; (9) the basic techniques of anesthesia; (10) the evaluation of patients relative to surgical and anesthetic risk; (11) the appropriate pre-operative preparation of patients subjected to surgery and anesthesia.  

(Dr. Dodd and Staff)

**Urology Elective.** A six-week period of clinical clerkship in urology offers the interested student an adequate knowledge of the type of problems with which the clinical urologist deals. The student is taught the basic diagnostic procedures and the management of surgical and nonsurgical patients on both the private and ward services under the supervision of the attending staff and house officers. The experience involves direct care of patients in the clinics, as well as of urologic admissions to the hospital. Daily morning and evening rounds on all patients on a particular service are conducted by the responsible resident. Two additional teaching rounds for the house staff and students will be held weekly. In addition, the student will attend daily X-ray conferences, the weekly staff conference, and the pathology conference and journal club conducted every other week. The student will be given an opportunity to assist in open and endoscopic surgery, as well as in the various diagnostic procedures performed in the cystoscopy and urography section.  

(Dr. Cordonnier and Staff)

**Oncology Elective.** Students electing to study the theoretical and practical aspects of the epidemiology, diagnosis, treatment, and prognosis of neoplastic diseases in man may select a program (subject to the approval of the Tumor Committee) which includes interdepartmental experience in several of the following areas of knowledge:

1. Surgical Pathology of Neoplasms.  
2. Surgical Pathology of Gynecologic Neoplasms.  

(Dr. Ackerman)  
(Dr. Black)  
(Dr. Vietti)
5. Radiation Therapy of Neoplasms.  

(Dr. Ogura)  
(Dr. Powers)  
(Dr. Reinhard)  

All students attending the oncology elective will be expected to attend regularly the following conferences:

1. Tumor conference, 3:00 to 4:00 p.m., Wednesday.  
2. GYN cancer conference, 8:00 to 9:00 a.m., Monday.  
3. E.N.T. tumor conference, 12:00 noon every other Thursday.  
4. Neoplastic hematologic conference, 8:00 to 9:00 a.m., Wednesday.  
5. Cancer workshop, 6:30 to 8:00 p.m., monthly, September to June.  

Each student taking an elective in oncology must select (or be assigned) a problem for study in the field. Each student will be expected to report to his peers and instructors on the selected subject at the end of the elective period. Members of the Tumor Committee will evaluate the report, as well as the student's performance during the elective.  

(Drs. Ackerman, Butcher, and Staff)  

Ellis Fischel Elective. The Ellis Fischel State Cancer Hospital and Cancer Research Center jointly have Departments of Surgery, Medicine, Radiotherapy, Anatomical Pathology, Biostatistics, and Biochemistry, with full-time teaching-research oriented staffs. Active training programs are available in all of these departments. Students are welcome to take electives in any department. The staff is of the opinion that medical students derive the greatest benefit from a split elective in surgery, radiation therapy, and anatomical or tumor pathology and internal medicine (with emphasis on cancer chemotherapy and hematology). Since the hospital attends approximately ten per cent of the cancer patients in the State and maintains a comprehensive follow-up in the outpatient clinic, the clinical experience derived from participation as a working member of the clinical teams in these various departments gives the students an excellent training experience in clinical oncology. A short-term clinical research project during the clerkship is encouraged. This is either initiated by the student's curiosity or is assigned by a member of the clinical staff. Training in the design of a clinical experiment and analysis of clinical data is co-ordinated through the Department of Biostatistics. The student has the choice of concentrating his entire elective experience on a single service if he desires.  

(Dr. Spratt and Staff)
Dr. Jerome Cox, Jr., Director, discusses a project with student working at the LINC.

BIOMEDICAL COMPUTER LABORATORY

The Biomedical Computer Laboratory collaborates with research investigators in the application of modern information-processing techniques to problems in biology and medicine. Research and training is offered to medical students and graduate students in applications of mathematical techniques to biomedical problems and in applications concerning information processing in the research laboratory.

Currently one of the foremost aids in laboratory applications of digital computers is the LINC (Laboratory Instrument Computer), a small stored-program computer which was designed specifically for the biology laboratory. Four LINC computers are available to students. Three Programmed Consoles, a smaller computer designed at BCL, are also available and are connected by telephone lines to an IBM 360-50 at the Washington University Computation Center.
Professor and Director of the Laboratory

Jerome R. Cox, Jr., S.B., Massachusetts Institute of Technology, 1947; S.M., 1948; Sc.D., 1954. (See Departments of Physiology and Biophysics and Electrical Engineering)

Associate Professor

Richard A. Dammkoehler, B.S.I.E., Washington University, 1956; M.S.I.E. 1959. (See Department of Applied Mathematics and Computer Science)

William F. Holmes, A.B., Princeton University, 1953; Ph.D., University of Pennsylvania, 1960. (See Department of Biochemistry)

Maxine L. Rockoff, B.S., George Washington University, 1958; M.A., University of Pennsylvania, 1960; Ph.D., 1964. (See Department of Applied Mathematics and Computer Science)

Assistant Director for Engineering


Administrative Officer

Edward L. MacCordy, B.S., Tufts University, 1947; M.S., Rensselaer Polytechnic Institute, 1957. (See Computer Systems Laboratory)

FOURTH YEAR

Digital Computers for Laboratory Use. Methods of using small digital computers with laboratory instruments. Basic programming, data collection and conversion, data processing, digital control, output techniques. (Dr. Holmes)

ELECTIVE COURSE

Computer Programming. Short, intensive courses are offered twice each year covering the operating principles of digital computers, programming the LINC, and fundamentals of FORTRAN. Arrangements should be made with the instructor. (Mr. M. McDonald)

Externships in Biomedical Computing of two or three months' duration are offered during the summer for students who have completed the first year of the Medical School curriculum. Opportunities to carry out research are also available to graduate students on a year-round basis.

The Biomedical Computer Laboratory is affiliated with the Computer Systems Laboratory located in nearby quarters at the School of Medicine. The mission of the Computer Systems Laboratory is the design and development of advanced computer systems with a current focus on the development of a compatible set of "macromodules" from which arbitrary large, complex, or specialized computer systems can be assembled. These systems will be applied to several challenging problems in physiology and medicine.
Medical jurisprudence. A course given in the fourth year embracing medical evidence and testimony, expert testimony; dying declarations; rights of medical witnesses; establishing identity from living and dead bodies, sudden death from natural causes and by violence; criminal acts determined by medical knowledge; the legal relation of physician to patients and the public; insanity; and malpractice.

(Mr. Orville Richardson)
TEACHING AND RESEARCH DIVISIONS

DIVISION OF GERONTOLOGY

The Division of Gerontology is located at the St. Louis Chronic Hospital, 5600 Arsenal Street. The Division conducts a research laboratory at the Hospital.

Through a bequest from the late Mrs. Ina Champ Urbauer, a fund has been established for research in gerontology and allied fields.

Director of Research
John E. Kirk, M.D., University of Copenhagen, 1929. (See Department of Medicine)

Research Instructor
Teofil Kheim, M.D., University of Budapest, 1934.

Research Assistant
Saichi Hosoda, M.D., University of Tokyo, 1956.

INSTITUTE OF NEUROLOGY

The Beaumont-May Institute of Neurology was established in 1955 by gifts from the Louis D. Beaumont Foundation, Mr. Morton J. May, and the late Mrs. Charles M. Rice. It is the purpose of the Institute to foster basic and clinical research in Neurology with special reference to defects in the structuring of the nerve cell which occasion important neurological disorders having a high incidence of prolonged disability.

NEUROBIOLOGY

Committee

Professor Davis, Chairman; Associate Professor Cohen, Committee Secretary; Professors Cowan, Cox, Dodge, Eldredge, Goldring, Hamburger, Hunt, Landau, Levi-Montalcini, Lowry, O'Leary, Robins, Sandel, Schoepfle, Smith, Stern; Associate Professors McDougal, Molnar, Pfeiffer, Pitts, Torack; Research Associate Professor Enoch; Assistant Professors Latsch, Schlaepfer.

The graduate program in Neurobiology is an inter-campus program of study leading to the degrees of Master of Science and of Doctor of Philosophy in either the title Neurobiology or in nonclinical titles of one of the University departments, committees, or University-affiliated institutions participating in the program. Medical students may apply for admission to this program and successful applicants may, through individual arrangements, pursue additional studies and research leading to a Doctor of Philosophy degree through the Neurobiology program in addition to continuing their work toward their medical degree.

Departments and groups participating in the program are Anatomy, Biology, Central Institute for the Deaf, Electrical Engineering, Neurology, Neurosurgery, Ophthalmology, Otolaryngology, Pathology, Pharmacology, Physiology, Psychiatry, Psychology, and the Washington University Computer Laboratories.
The program of study is adjusted to the particular aims of individual students, and includes such fundamental problems of organization and function of the nervous system as mechanisms of sensing the external and internal environments; the conversion of adequate stimuli into signals and the transmission of coded information; information storage and retrieval; the evaluation of information and initiation of responses; gross anatomy and microstructure; development, organization, and regeneration; biochemical features of structure, action, and control in neural tissues and systems.

Interested students should consult the Executive Secretary, Committee on Neurobiology, Washington University School of Medicine, 4550 Scott Avenue, St. Louis, Missouri 63110.

DIVISION OF TUMOR SERVICES

Cancer Co-ordinator and Director of Division of Tumor Services

Harvey R. Butcher, Jr., A.B., Central College, 1941; M.D., Harvard University, 1944.

The Division of Tumor Services was organized as a co-ordinating committee for the Cancer Teaching Program. Inasmuch as cancer, as other subjects in the medical curriculum, is given in a departmental manner, the Tumor Clinic is the principal site on which this Service functions. Using the Tumor Clinic facility, an attempt is made in this center to supplement and co-ordinate problems relating to neoplastic disease as it exists today. In the junior year, time is allotted to students for working in the Tumor Clinic, where they gain first-hand experience with such problems. The Tumor Conference is held each week for members of the junior class, postgraduate students, and visitors, and serves as a forum for demonstrating some of the more complex problems in diagnosis and therapy which arise in patients with malignant disease. In the senior year, students may elect periods of study which expose them to the theoretical and practical aspects of the epidemiology, diagnosis, treatment, and prognosis of various human neoplasms in man. This program is tailored to the particular interests of each student with the approval of the Executive Committee of the Tumor Services. These oncological electives for seniors may include studies in any of the following fields: Surgical Pathology, Neoplasms in Children, Surgical and Radiational Therapy, Hematologic Neoplastic Disease and the Epidemiology of Cancer.
WILLIAM GREENLEAF ELIOT DIVISION OF CHILD PSYCHIATRY

The Division of Child Psychiatry offers a varied teaching program for residents in Psychiatry and Fellows in Child Psychiatry through its Child Psychiatry Clinics and the school for emotionally disturbed children at 369 North Taylor Avenue, the St. Louis County Division of Mental Diseases, and the Youth Center at the St. Louis State Hospital. Trainees are assigned to these various units where they participate in complete diagnostic evaluations and see patients in treatment under the supervision of the unit doctor and the Professor of Child Psychiatry. Seminars in child psychiatry, child development, individual and group treatment, clinical psychology, social work, and research are held weekly at the Division building on Taylor Avenue. New methods of teaching and observation (video-taped sessions, one-way screens, clinical films) are in regular use. The Child Development Research Center, attached to the Division of Child Psychiatry, is carrying out systematic research in child psychiatry with the help of funds from the National Institute of Health. Fellows in Child Psychiatry with special research interests can participate in the various research programs.

Director and Blanche F. Ittleson Professor

Director of the Child Psychiatry Clinics and Assistant Professor of Child Psychiatry
Thomas C. Brugger, B.S., University of Wisconsin, 1950; M.D., 1953.

Assistant Professors
Loretta Cass (Medical Psychology), B.A., Colorado College, 1934; M.A., 1942; Ph.D., Ohio State University, 1950. (Also Department of Psychology)

Assistant Professors (Clinical)
Roy M. Mendelsohn (Child Psychiatry), B.S., University of Illinois, 1950; M.D., 1952.
Paul H. Painter (Child Psychiatry), M.D., St. Louis University, 1947. (See Department of Pediatrics)

Consultant
Eleanor T. Kenney (Medical Psychology), A.B., Bryn Mawr College, 1937; Ph.D., Washington University, 1964.

Instructors
Gabrielle Casebier (Speech Correction), B.S., University of Illinois, 1942; M.A., 1942; Ph.D., University of Wisconsin, 1961.
Douglas R. Gowler (Child Psychiatry), M.D., Manitoba Medical College, 1948.
John B. Lewis (Medical Psychology), B.S., Northwestern University, 1949; M.S.W., Washington University, 1952.
Eve May Spinney (Psychiatric Social Work), B.A., University of Kentucky, 1957; M.S.W., St. Louis University School of Social Work, 1961.
Marilyn Voerg (Medical Psychology), B.A., University of Florida, 1950; Ph.D., 1964. (Also Department of Education)

Research Instructors
Boaz Kahana (Medical Psychology), B.A., Yeshiva University, 1955; M.S., 1957; Ph.D., University of Chicago, 1966.
John Plapp (Medical Psychology), B.A., University of Melbourne, 1959; Ph.D., Washington University, 1966.

Instructor Emeritus and Lecturer
Louetta Berger (Psychiatric Social Work), B.S., University of Wichita, 1941; M.S.W., Washington University, 1946.

Instructors (Clinical)
Lois E. Franklin (Medical Psychology), B.A., Blackburn College, 1930; M.A., MacMurray College, 1932.

Doris C. Gilpin (Child Psychiatry), B.S., Drury College, 1944; M.D., University of Chicago School of Medicine, 1948.
Anna E. Hartnett (Child Psychiatry), B.S., Loyola University, 1956; M.D., Ottawa University, 1960.
Sophia P. McCay (Child Psychiatry), B.S., University of Denver, 1949; M.D., University of Colorado, 1959.
Saul Niedorf (Child Psychiatry), B.A., University of California at Los Angeles, 1952; C.S.W., 1953; M.D., University of Geneva, 1959.
Edith C. Robinson (Child Psychiatry), A.B., Randolph-Macon College, 1927; M.S., University of South Carolina, 1928; M.D., Johns Hopkins University, 1932. (See Department of Pediatrics)

Assistants
Marlys K. Allen (Speech Correction), B.S., Iowa State University, 1960; Ed.M., Boston University, 1964.
Donna L. Evert (Education), B.S., Kansas State University, 1966.
Rivka Ezekiel, B.S.W., Hebrew University, 1964.
Priscilla Liang Hsu (Psychiatric Social Work), B.A., Tunghai University, 1960; M.S.W., University of Hawai, 1963.
Marily M. Shapiro (Psychiatric Social Work), B.A., Sophie Newcomb College, 1963; M.S.W., Tulane University, 1965.

Research Assistants
Audrey G. Senturia (Child Psychiatry), A.B., Washington University, 1937.

Lecturer
Robert E. Lefton (Medical Psychology), A.B., Washington University, 1953; Ph.D., 1958.
DIVISION OF AUXILIARY MEDICAL SERVICES

The Division of Auxiliary Medical Services of the School of Medicine provides instruction and training in professions associated with medicine and necessary to the physician in providing modern health care.

The Division of Auxiliary Medical Services is a joint enterprise of the School of Medicine and the affiliated hospitals—Barnes Hospital, Barnard Free Skin and Cancer Hospital, Central Institute for the Deaf, Jewish Hospital of St. Louis, St. Louis Children's Hospital; Washington University School of Medicine: McMillan Hospital, Renard Hospital, David P. Wohl, Jr., Memorial Hospital, David P. Wohl, Jr., Memorial Clinics, Women's Hospital. As a matter of convenience some departments are administered by the School and others by Barnes Hospital.

Departments conducted by the School of Medicine include Hospital Administration, Occupational Therapy, and Physical Therapy. Departments operated by Barnes Hospital include Medical Dietetics and Anesthesiology. All of the courses are approved by the American Medical Association or other certifying agencies, and graduates are admitted to examinations. For further information write to the director of the department or school, Washington University School of Medicine, 660 South Euclid Avenue, St. Louis, Missouri 63110.

GRADUATE PROGRAM IN HOSPITAL ADMINISTRATION

The Washington University Graduate Program in Hospital Administration, established in 1946, is fully approved and is one of the eight charter members of the Association of University Programs in Hospital Administration. Since it is the only hospital and health administration program that has its locus in a medical school, there is an opportunity not only for interdisciplinary integration with students in the Graduate School of Arts and Sciences and the Graduate School of Business Administration, but also with students of medicine and other allied professions with whom the hospital and health administrator will be predominantly associated through his career. The two-year academic sequence leads to the degree Master of Hospital Administration.

Assistant Professor and Director

Instructor and Assistant Director

Professor Emeritus
Frank R. Bradley, M.D., Washington University, 1928; LL.D., Central College, 1943.

Assistant Professors
The School of Medicine

Donald J. Horsh, B.S.B.A., University of Nebraska, 1941; M.H.A., Washington University, 1951; LL.B., St. Louis University, 1953.

Instructor


Lecturers

Robert E. Adams, B.S., University of Nebraska, 1941.
Hollis Allen (Medical Specialties), B.S., St. Louis University, 1924; M.D., 1926.
Louis Belinson, B.A., University of Wisconsin, 1930; M.D., University of Chicago, 1935.
Albert L. Boulenger, B.S., Bowling Green State University, 1949; M.H.A., Washington University, 1953.
Ted Bowen, B.S., Austin College, 1941; M.H.A., Washington University, 1948.
John W. Claiborne, Jr., B.A., Vanderbilt University, 1929; M.D., 1932.
John R. Eckrich.
Frank S. Groner, A.B., Baylor University, 1934; LL.D., East Texas Baptist College, 1946; LL.D., Union University, 1952.
Robert J. Guy, B.A., Emory University, 1941.
Warren G. Harding II, B.A., Ohio State University, 1924; Ph.D., 1966; M.A., University of Southern California, 1929; M.D., Loma Linda University, 1950.
James D. Harvey, B.A., University of South Dakota, 1930; M.H.A., University of Minnesota, 1952.

Harold Hinderer, B.A., College of St. Thomas, 1952.
Lilly Hockstra, R.N., Washington University, 1933; B.S., 1947.
Robert S. Hoyt.
Joseph H. Leahy, Colonel, U.S.A.F. (M.S.C.)
Sister Mary Isidore Lennon, R.S.M., B.S.N., St. Louis University, 1933; M.A.; 1934; M.S.W., 1949.
Ted Lloyd (State Hospital Association Activities).
Don MacDonald, Ph.B., Marquette University, 1949; M.A.S.A., Ohio State University, 1951.
Gerald Malloy, Ph.B., Marquette University, 1950; LL.B., 1953, M.H.A., St. Louis University, 1955.
Elizabeth McTintosh, A.B., Scarritt College, 1950; B.S., University of Pennsylvania, 1942; M.S., Western Reserve University, 1947.
Richard D. O'Harrarson, B.S.C., St. Louis University, 1952; M.H.A., 1957.
Harry E. Panhorst, A.B., Central College, 1936; B.S., University of Missouri, 1938; M.H.A., Washington University, 1949.
Boone Powell, L.L.D., Baylor University, 1958.
Paul I. Robinson, B.S., Washington University, 1926; M.D., 1928.
Albert Spradling, Jr., LL.B., University of Missouri, 1942.
Crofford O. Vermillion, B.A., DePauw University, 1939; M.D., Washington University, 1947.
The sequence of study consists of an on-campus academic exposure of a minimum of twelve months, followed by an off-campus practicum of nine months at an approved hospital or health agency.

In the plan of academic study, emphasis is initially placed on providing conceptual principles and analytical tools to prepare graduates for effective executive roles in the management functions of hospitals and other direct patient care facilities. In the more advanced stages, the study plan calls for a broad exposure to educate graduates for eventual positions in general health administration, teaching, and investigation.

The purpose of the administrative residency is to provide the graduate student with an opportunity to observe pragmatically and possibly implement under the preceptor's supervision, the concepts and principles learned during on-campus academic exposure. This requirement is completed under the direction of a well qualified and experienced administrator who serves in the capacity of an off-campus faculty member.

Until recently, little research has been conducted in the hospital and health administration field. As a result, administrators have been handicapped in effective decision making, long-range planning, and policy formation. Therefore, the program places strong emphasis on research in health care in collaboration with the Medical Care Research Center, a joint effort of Washington University, The Jewish Hospital of St. Louis, and other health agencies and institutions in the Greater St. Louis metropolitan area. Through courses in research methodology and the use of Medical Care Research Center resources, the degree candidate is provided with the investigative tools to equip him to prepare a thesis in partial fulfillment of the requirements for the Master of Hospital Administration degree.

In addition to those listed below, several elective courses are available in the Graduate School of Business Administration and the Graduate School of Arts and Sciences on the hilltop campus of Washington University.

HA 500. Hospital Management. The organization aspects of the operation of a general acute hospital, including the history of the hospital, the role of the board of trustees, the medical staff, the hospital staff, the administrator, the components of patient care, and hospital controls and criteria. Credit 3 units.  (Mr. Frank)

HA 501. Hospital Management. Continuation of HA 500, with in-depth analysis of various hospital departments such as admitting, nursing, dietary, purchasing, building, services, clinical laboratories, pharmacy, X-ray, medical records, stores, etc. Prerequisite, HA 500. Credit 3 units.  (Mr. Frank)
HA 502, 503. **Financial Management for Hospitals.** This course is designed to familiarize the student with accepted practices in hospital financial management. The use of cost analysis and cost accounting as an aid to administration in planning, organizing, and controlling the hospital organization. Relationship with third-party payers and the accounting aspects of purchasing. First and second semesters. Credit 3 units each semester. (Mr. Hinderer)

HA 30-314. **Group Discussion and Conference.** Conference and discussion techniques for leaders and participants. Organization, direction, and methods of discussion, including preparation of agenda, pre-conference organization, parliamentary procedure, and committee techniques. Provides training for participation in hospital activities, employer-employee relationships, and community activities. Material will be drawn from the interests and experience of the class. Credit 3 units. (Mr. Metz)

HA 510, 511. **Medical Care Administration.** Includes the science and art of health services and their utilization for the welfare of people. Deals with the services of all kinds of practitioners and agencies, public and private, which provide health services, and is concerned with the health services needed by people and the services received, the structure and organization of these services, their costs, and methods by which the costs are met or financed. It includes both community-wide and personal health services, whether for the prevention of diseases, for diagnoses, treatment, or rehabilitation. Second semester includes case studies in addition to continuation of HA 510. Credit 3 units. (Dr. Hepner, Mr. Panhorst)

HA 530. **Medical Staff Organization.** This course covers the many facets of the impact that physicians have on hospitals, with special emphasis on the way in which the physician directly or indirectly affects the hospital operation. The course not only provides a description of the medical staff functions and activities, but shows the student the nuances of political, public relations, and financial stress that can be created within and outside the hospital organization. Credit 3 units. (Mr. Gee)

HA 531. **History of Medicine.** An introduction to the history of medicine from the ancient and early Greek and Roman medicine to the present day. Specific emphasis is placed upon advancements in conquering catastrophic disease and the role of medical education and scientific methods in development of medicine. Credit 2 units. (Dr. Brodman)

HA 532. **Public Health.** Includes history and organization of public health service, legal considerations in public health, bacteriological environment in hospitals, community air pollution and its control, and maternal and child health. Credit 3 units. (Staff)

HA 540, 541, 542. **Seminar in Hospital and Health Administration.** Discussion of various aspects of hospital and health administration as they relate to the contemporary scene. Credit 1 unit each semester. (Dr. Hepner)
HA 550. Comprehensive Health Planning. The explanation and analysis of the social process directed toward the improvement of the health system through an attempt to optimize the allocation of scarce resources; for provision of health care for the community in its broadest sense by the analysis and interaction of individuals, groups, and organizations. Credit 3 units. (Mr. Nelson)

HA 560. Legal Aspects of Hospital Administration. Covers the essentials of the law of hospital administration. The objective of the course is to prepare the student to understand and appreciate the legal aspects of hospital administration and thereby reduce the incidence of medico-legal complications arising out of hospital operations. The hospital is approached from a legal standpoint as a business organization, medical service institution, social institution, a government institution, and as a total legal entity. Credit 2 units. (Mr. Horsh)

HA 600. Research in Medical Care. An introduction to research methods in the area of health care administration. Specific emphasis is placed upon the formulation of a research problem, specifications of hypothesis, instrumentation formulation, data gathering, analysis of data, and written and oral presentation of the investigation. Credit 3 units. (Drs. Coe, Hepner)

HA 601, 602, 603, 604. Research in Medical Care. With the use of the Medical Care Research Center as a resource in formulating thesis topic and as a basis for completing the requirements of the thesis, this course is a continuation of HA 600. Credit to be arranged. (Drs. Coe, Hepner)

HA 610. Clinical Practicum in Hospital/Health Administration. Provides the student with an opportunity to observe pragmatically and possibly implement, under clinical faculty supervision, the concepts and principles learned in the prerequisite academic sequence. (Preceptors)

HA 620. Clinical Practicum in Health Planning. Provides the student with an opportunity to observe pragmatically and possibly implement, under clinical faculty supervision, the concepts and principles learned in the prerequisite academic sequence. Particular emphasis is placed upon data gathering, formulation, and implementation of comprehensive health planning policies. Requires special consent of Director. (Mr. MacDonald)

HA 630. Seminar in Hospital and Health Administration. Advanced seminar for students serving residencies in the geographic vicinity of the University which relates their clinical experience to the academic theory regarding the broader concepts of health administration. Credit to be arranged. (Dr. Hepner)

Inquiries are welcomed at all times. Applicants are required to have a minimum of a bachelor's degree from an accredited university or college acceptable to Washington University, including the successful completion of a minimum of six units of under-
graduate accounting and three units of statistics prior to matriculation. The aptitude test of the Graduate Record Examination is required of all applicants. There is no specification of major fields that must have been completed at the undergraduate level. However, a broad background in the behavioral sciences and business administration is desirable. Applicants with graduate or Doctor of Medicine degrees are also invited to submit their credentials. After an initial screening by the Credentials Committee, selected applicants are invited to the campus at their own expense for a personal interview.

The program is limited to a class of twenty-five full-time students annually. No part-time students are admitted to the program.

Further information may be obtained from the Director, Graduate Program in Hospital Administration, Washington University School of Medicine, 724 South Euclid Avenue, St. Louis, Missouri 63110, telephone (314) 367-6400, Station 3277.

Tuition (academic, $900 each semester for three semesters) $2,700.00
Tuition (practicum, clinical administrative residency) 300.00
Student health fee 110.00
Late registration fee 5.00
Books and supplies (approximately $75 a semester) 225.00

DEPARTMENT OF OCCUPATIONAL THERAPY

Assistant Professor and Elias Michael
Director of the Department
Martha E. Matthews, A.B., Winthrop College 1933.

Assistant Professor and Associate Director of the Department in Charge of Clinical Training
Elizabeth Withers, B.S., Memphis State University, 1957; M.A., 1959.

Instructors
Margaret S. Nelson, B.S., Ohio State University, 1956; M.S., San Jose State College, 1966.
Garth D. Tubbs, B.S., Wisconsin State College, 1953.

Instructor Emeritus
Ada Wells Ford.

The degree of Bachelor of Science in Occupational Therapy is conferred upon the completion of three academic semesters at the School of Medicine and nine months of supervised clinical application. During the academic and clinical programs, emphasis is placed on the patient's physical and psychological problems resulting from disease and trauma. Basic understanding of the techniques of creative, manual, and pre- voca-
tional media and how these are correlated therapeutically to provide desired treatment are stressed.

The role of occupational therapy as it functions with various medical and social resources within the broad concepts of patient rehabilitation is an important part of the course.

The curriculum includes sciences such as anatomy, physiology, psychology, and neurology; clinical subjects such as general medicine, orthopedics, and psychiatry; interpretation of principles and practices of occupational therapy; technical instruction in manual, creative, and prevocational activities. The period of supervised clinical application is spent in approved affiliation centers.

Applicants must present sixty semester hours of college credit, including a specified number of units in English, biology, physical science, psychology, and sociology.

Candidates for B.S. degree

| Tuition (three semesters), per semester | $900.00 |
| Tuition (clinical year), per year | 600.00 |
| Student Health Fee (three semesters), per semester | 55.00 |
| Late Registration Fee | 5.00 |

DEPARTMENT OF PHYSICAL THERAPY

Assistant Professor and Director of the Department


Assistant Professor

Lorraine F. Lake, B.S., Washington University, 1950; M.A., 1954; Ph.D., 1962. (See Department of Anatomy and Institute of Rehabilitation)

Instructors

Isabelle M. Bohman, B.S., Skidmore College, 1951; M.S., University of Illinois, 1954.
Robert Hickock, B.S., Washington University, 1953.

The program of instruction in physical therapy in the School of Medicine consists of the junior and senior years of a four-year college curriculum leading to the degree of Bachelor of Science in Physical Therapy.

Students entering this program must have satisfactorily completed sixty semester hours in an accredited college or university. Required are courses in English composition, literature, psychology, and the physical, biological, and social sciences.

The program in the School of Medicine includes courses in the basic medical sciences, medical and surgical lectures as applied to the practice of physical therapy,
theory and application of physical therapy procedures, and a minimum of 800 hours of clinical experience.

The aim of the program is the development of competent physical therapists whose broad cultural background and thorough professional training prepare them to accept the appropriate responsibilities in the comprehensive care program of modern medicine. The course is described in greater detail in the Department of Physical Therapy Bulletin which may be secured by addressing a request to that Department.

| Tuition (three semesters), per semester | $900.00 |
| Tuition (final semester)               | 600.00  |
| Student Health Fee, per semester       | 55.00   |
| Late Registration Fee                  | 5.00    |

**X-RAY TECHNOLOGY**

A two-year course for X-ray technologists is offered by the Mallinckrodt Institute of Radiology. The course covers, by lectures and group discussions, the following subjects: anatomy and physiology; radiographic technique; radiation physics; darkroom processing procedures; nursing procedures; administration; radiation therapy; professional ethics; medical terminology; medical isotopes; survey of medical and surgical diseases and radiographic positioning.

During the first six months a student is on probation and, upon satisfactory completion of his work, will be paid a monthly stipend of $50.00. This stipend will increase to $75.00 for the third six months and $100.00 for the last six months. During the twenty-four months, students will be assigned tours of duty in the various sections of the diagnostic and therapeutic areas for their practical experience. A certificate is given after successful completion of the training program.

Candidates for admission must be certified graduates of an accredited secondary school and should rank in the upper third of their class. Special consideration will be given to graduates of schools of nursing which are recognized by the State Board of Nurse Examiners and to students who have passed a college entrance examination for admission to an accredited college or university. A student health fee of $110.00 is compulsory the first year, and the cost of books is approximately $65.00 for the two years. There is no tuition charge.
DIETETICS

Doris Cook, B.S.  Director
Helen Starch, B.S.  Educational Director

A twelve-month course for the training of dietitians leading to a certificate and eligibility for membership in the American Dietetic Association.

The course includes theoretical and practical training in food service and personnel administration, food production and cost control, diet therapy, teaching nutrition, outpatient instruction, and affiliation with the St. Louis Children’s Hospital.

A bachelor’s degree from an accredited college or university is required for admission. Certain courses in chemistry, biology, social science, education, food, nutrition and dietetics, and institutional management are essential.

There is no tuition fee, but a matriculation fee of $10.00 must be deposited as soon as an application is accepted. Maintenance is provided. A monthly stipend of $50.00 is paid.

ANESTHESIA FOR NURSE ANESTHETISTS

Dean E. Hayden, R.N.  Director
Louise Grove, R.N.  Educational Director

A twenty-four-month course for special training in the practical administration of anesthetics by approved medical techniques and the theory underlying their skilled administration. Upon satisfactory completion of the course, a certificate is awarded.

The theoretical aspect of the subject is covered by specific periods of organized instruction. Instruction in the practical administration of anesthetics takes place in the operating rooms, where at first the student observes, then administers anesthetics under an instructor’s supervision, and eventually conducts complete anesthesias upon her own responsibility.

The course is open to graduates of accredited schools of nursing. The tuition is $200.00. Full maintenance is provided. A stipend of $50.00 per month is paid after six months, $150.00 per month after twelve months, and $400.00 per month without maintenance after eighteen months.
St. Louis Children's Hospital.
The Alumni Association of the Washington University School of Medicine was organized with the following object and purpose: to promote a spirit of class fellowship among its members, to further the interests and standing of the Washington University School of Medicine, and to stimulate an interest in the advancement of medical and collateral sciences.

The Association, whose membership is made up of all graduates of the School of Medicine and all members of the faculty, is active in its support of the School and of the student body. Each year a welcoming party is given for the incoming freshman class and, prior to Commencement, the Association sponsors the annual alumni banquet at which the graduating seniors are guests. A reunion is held on that day featuring a scientific program presented by graduates and faculty members and a buffet luncheon at which the alumni and senior students are guests of the School of Medicine and its faculty.

Each year the Medical Alumni Association sponsors a luncheon for local high school students who are especially talented in science and who have indicated a desire to attend medical school. The Alumni Office prepares and distributes a schedule of conferences and a list by departments of the meetings in the medical group which are open to physician attendance.

A Student Loan Fund is maintained to assist medical students with emergency loans. Upon approval by the Alumni Committee on Loans and Scholarships, students past the freshman level may borrow up to $1,000 a year, or a total of $3,000 during their medical school career. Each fall the Association awards a tuition scholarship of $200 to a medical student for excellence in work during the preceding year. The Board of Trustees of the University includes a representative from the Medical Alumni.

In 1967-68 the officers of the Association were: C. Read Boles, M.D. '43 (December), president; Melvin L. Goldman, M.D. '43 (March), president-elect; John L. Horner, M.D. '36, vice president; Richard W. Hudgens, M.D. '56, secretary-treasurer; and Eugene M. Bricker, M.D. '34, representative to the Board of Trustees of the University.
PRIZES AWARDED 1966-1967

Gill Prize in Anatomy
Paul Cooper Simpson, A.B.

Chouké Prize in Anatomy
Paul Cooper Simpson, A.B.

The Carl F. and Gerty T. Cori Prize in Biochemistry
Alexander Lewis Miller, B.A.

St. Louis Pediatrics Society Senior Prize
Douglas Wayne Alvord, B.A.

Sidney I. Schwab Book Prize
Edward Kent Stevenson, B.S.

Borden Undergraduate Research Award
Robert John Clark, B.S.

Alpha Omega Alpha Book Prize
Michael Bernard Jacobs, A.B.

Prize of the Medical Fund Society in Medicine
John Raber Feagler, A.B., M.S.

Prize of the Medical Fund Society in Surgery
Richard Clarke Shaw, A.B.

McCordock Book Prizes
Michael Theodore Levy, B.A.
Barry Alan Siegel, A.B.

Roche Award
Barry Alan Siegel, A.B.

Medical Alumni Fund Scholarship
David Lee Stabenow, B.S.

Missouri State Medical Association Annual Award
Michael Bernard Jacobs, A.B.

Bronfenbrenner Memorial Award
Allen Clair Campbell, B.S.

The Richard S. Brookings Medical School Prizes
Stephen Lee Ewing, A.B.
Donald Ray Kirks, B.A.
David Roy Krauss
Paul Stephen Simons, B.A.
Michael Joseph Specter

The Joseph J. Gitt and Charlotte E. Gitt Prize
Richard Barton Counts, A.B.

Baker Laboratories, Inc., Nutritional Award
Murray Alan Johnstone, B.A.
The Robert Carter Medical School Prizes
Jere Davies Cravens, B.S.
Stephen Allen Kamenetzky, A.B.
Frank Scott Letcher, B.A.
James Otis Lindsay II, A.B.

The National Foundation Merit Award
Philipp Emanuel Bornstein, B.S.

The Upjohn Achievement Award
Irving Louis London, B.A.

C. V. Mosby Company Book Awards
Larry Arthur Holle, B.A.
Paul Henry Lange, B.A.
George Bernard McDonald, B.S.

Robert Beatty McLean, B.A.
Richard Jay Slavin

Lange Medical Publications Book Awards
William Berman, Jr., A.B.
Sandra Jo Karm Counts, B.S.
Lawrence John Dunn, A.B.
Rand Terrell Frederiksen

Alexander Lewis Miller, B.A.
David Sinclair Schade, B.S.
Gary Dean Shackleford, B.A.
Arnold Wilbur Strauss, A.B.

Marilyn Agnes Mollman, B.A.

The Ifa Joe Kodner, A.B.
Frank Vinicor, B.A.

SCHOLARSHIPS 1967-68

Jackson Johnson Regional Scholarships
Kenneth Jerome Arnold, A.B.
William Berman, Jr., A.B.
Hudson Bradley Binnington, Jr., A.B.
Jeffrey Michael Brick, B.S.
Richard Arthur Brown, A.B.
Jere Davies Cravens, B.A.
Aubrey Pat Chambers, B.A.
Lucy Eileen Doyle, B.A.
Lawrence John Dunn, A.B.
Russell Ernest Eggebrecht, B.S.
William A. Grunow, B.A.
Maria G. Ikossi

Stephen Allen Kamenetzky, A.B.
David Gordon Kaufman, B.A.
Wallace B. Mendelson, A.B.
Seymour Packman, A.B.
Jeffrey Ross, A.B.
Richard Lawrence Schreiner, B.S.
Emily Louise Smith, A.B.
David Lee Stabenow, B.S.
Thomas Parker Wharton, Jr., B.S.
Thomas William Wicks, A.B.
Richard G. Wyatt, B.A.
FOURTH-YEAR CLASS (1967-68)  

Altman, Jeremy—Bellevue Hospital, New York University Medical Center, New York, New York

Anderson, Charles Frederic, B.A., Montana State Univ., '64; B.S., Univ. of North Dakota, '66—St. Paul-Ramsey Hospital, St. Paul, Minnesota

Arnold, Kenneth Jerome, B.A., Univ. of Notre Dame, '64—Barnes Hospital, St. Louis, Missouri

Asnis, Stanley Edwin—The New York Hospital, New York, New York

Baker, Gary Edwin, B.S., Univ. of Wyoming, '64—St. Luke's Hospital, St. Louis, Missouri

Barack, Bruce Millard, A.B., Washington Univ., '65—Jackson Memorial Hospital, Miami, Florida

Binnington, Hudson Bradley, Jr., A.B., Washington Univ., '64—Barnes Hospital, St. Louis, Missouri

Boedeker, Edgar Charles, A.B., Harvard Coll., '64—Barnes Hospital, St. Louis, Missouri

Border, Wayne Allen, B.S., Purdue Univ., '65—North Carolina Memorial Hospital, Chapel Hill, North Carolina

Brasfield, Daniel Lyntron, B.A., Vanderbilt Univ., '64—Charity Hospital, Tulane University Division, New Orleans, Louisiana

Brock, Jack Arthur, B.A., Miami Univ., '63—Cincinnati General Hospital, Cincinnati, Ohio

Buerk, Kenneth Melvin, A.B., Princeton Univ., '64—University of Minnesota Hospital, Minneapolis, Minnesota

Carlton, Lynn Norman, A.B., Wittenberg Coll., '64—Madigan General Hospital (Army), Tacoma, Washington

Chevis, Gerhard Wolfgang, A.B., Washington Univ., '63—Ben Taub General Hospital, V.A., Houston, Texas

Coleman, Ralph Edward, B.A., Evansville College, '64—Barnes Hospital, St. Louis, Missouri

Cravens, Jere Davies, B.S., Washington and Lee Univ., '64—University of Colorado Medical Center, Denver, Colorado

Croley, Thomas Frank, B.S., Purdue Univ., '65—University of Washington Hospitals, Seattle, Washington

Davidson, Harold James, Jr., A.B., Washington Univ., '64—Detroit General Hospital, Detroit, Michigan

Davie, Joseph Myrten, A.B., Indiana Univ., '62; A.M., '64; Ph.D., '66—Barnes Hospital, St. Louis, Missouri

Deen, Clark Wheeler, B.A., Amherst Coll., '64—Barnes Hospital, St. Louis, Missouri

Dennison, Carl Francis, B.A., Univ. of Notre Dame, '64—Charity Hospital, Tulane University Division, New Orleans, Louisiana

Dennison, Joseph Randall, B.S., Univ. of Nebraska, '64—Wm. A. Shands Teaching Hospital and Clinics, Gainesville, Florida

Dodge, Michael Eldon, B.S., Montana State Coll., '64—St. Louis Children's Hospital, St. Louis, Missouri

Ellis, William, B.S., Univ. of California, '64—Duke Hospital, Durham, North Carolina

Elson, Charles Otto III, A.B., Univ. of Notre Dame, '64—Cornell University Hospitals, New York, New York

Feldman, Neil Turk, B.S., Univ. of Maryland, '64—Barnes Hospital, St. Louis, Missouri

Flatness, Sonja Gail, B.S., Montana State Coll., '64—Children's Hospital of Los Angeles, Los Angeles, California

Geiger, Kenneth H., A.B., Antioch Coll., '64—Lincoln Hospital, New York, New York

Giron, Louis Tellez, B.A., Rice Univ., '64—State University of Iowa Hospitals, Iowa City, Iowa

Goforth, James Morris, B.A., Univ. of Texas, '64—Johns Hopkins Hospital, Baltimore, Maryland

Golden, David, A.B., Grinnell Coll., '64—Cornell University Hospitals, New York, New York

Gregg, Susan Annette, B.S., Univ. of Idaho, '64—Children's Hospital of Los Angeles, Los Angeles, California
<table>
<thead>
<tr>
<th>Name</th>
<th>Degree</th>
<th>University/Institution</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Halperin, Thomas Edgar</td>
<td>A.B.</td>
<td>Univ. of Michigan, '64 — University of California Hospital, Los Angeles, California</td>
<td></td>
</tr>
<tr>
<td>Hamm, Robert Lee</td>
<td>B.A.</td>
<td>Westminster Coll., '64 — St. Luke's Hospital, St. Louis, Missouri</td>
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<tr>
<td>Hanovitch, Gary David</td>
<td>B.A.</td>
<td>Rice Univ., '64 — Temple University Hospitals, Philadelphia, Pennsylvania</td>
<td></td>
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<tr>
<td>Harlow, Mark Charles</td>
<td>A.B.</td>
<td>State Univ. of South Dakota, '63; B.S.Med., '66 — Jewish Hospital, St. Louis, Missouri</td>
<td></td>
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<tr>
<td>Heath, Hunter III</td>
<td>B.A.</td>
<td>Texas Technological Coll., '64 — University Hospitals, Madison, Wisconsin</td>
<td></td>
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<tr>
<td>Hendin, Barry Allen</td>
<td>A.B.</td>
<td>Washington Univ., '64 — Jewish Hospital, St. Louis, Missouri</td>
<td></td>
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<tr>
<td>Herzberg, Donald Loren</td>
<td>A.B.</td>
<td>Maimonides Hospital, New York, New York</td>
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<tr>
<td>Holder, Lawrence Edward</td>
<td>B.A.</td>
<td>Vanderbilt Univ., '64 — Jewish Hospital, St. Louis, Missouri</td>
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<tr>
<td>Karlin, Joel Marvin</td>
<td>B.A.</td>
<td>New York Univ., '64 — The New York Hospital, New York, New York</td>
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<tr>
<td>Kashi, Stephen Lee</td>
<td>B.S.</td>
<td>Davidson Coll., '64 — Barnes Hospital, St. Louis, Missouri</td>
<td></td>
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<tr>
<td>Kaufman, David Gordon</td>
<td>B.A.</td>
<td>Reed Coll., '67 — Barnes Hospital, St. Louis, Missouri</td>
<td></td>
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<tr>
<td>Kirs, Donald Ray</td>
<td>B.A.</td>
<td>Rice Univ., '64 — Parkland Memorial Hospital, Dallas, Texas</td>
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<tr>
<td>Kotner, Lawrence Melvin</td>
<td>A.B.</td>
<td>Washington Univ., '65 — Jewish Hospital, St. Louis, Missouri</td>
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<tr>
<td>Kramer, Sandra Sue S.</td>
<td>B.A.</td>
<td>Rice Univ., '63 — Bronx Municipal Hospital, New York, New York</td>
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<tr>
<td>Lander, Jerrold J.</td>
<td>A.B.</td>
<td>Washington Univ., '64 — Royal Victoria Hospital, Montreal, Canada</td>
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<td>Larner, Bernard Jerome</td>
<td>B.A.</td>
<td>Reed Coll., '64 — University of Chicago Clinics, Chicago, Illinois</td>
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<tr>
<td>Lipton, George Myron</td>
<td>B.S.</td>
<td>Maimonides Hospital, New York, New York</td>
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<tr>
<td>Loverde, Vernon Douglas</td>
<td>B.S.</td>
<td>Purdue Univ., '64 — State University (New York), Kings County Medical Center, New York, New York</td>
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<tr>
<td>McCulley, James Parker</td>
<td>B.S.</td>
<td>Texas Christian Univ., '63 — Boston City Hospital, II and IV Medicine, Harvard, Boston, Massachusetts</td>
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<tr>
<td>Michlin, John Paul</td>
<td>B.A.</td>
<td>Albany Medical Center, Albany, New York</td>
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<tr>
<td>Nicol, Sheldon Spencer</td>
<td>B.A.</td>
<td>Illinois Wesleyan Univ., '64 — Highland General Hospital, Oakland, California</td>
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<td>Nusratal, James Michael</td>
<td>B.S.</td>
<td>Univ. of Notre Dame — Jewish Hospital, St. Louis, Missouri</td>
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<td>Orchard, Richard Allen</td>
<td>A.B.</td>
<td>Grinnell Coll., '64 — Indiana University Medical Center, Indianapolis, Indiana</td>
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<tr>
<td>Packman, Seymour A.B.</td>
<td>Columbia Coll.</td>
<td>'63 — Postdoctoral Fellow in Medical Genetics, Washington University School of Medicine</td>
<td></td>
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<tr>
<td>Pearson, William Edward</td>
<td>B.S.</td>
<td>Texas Christian Univ., '65 — St. Luke's Hospital, St. Louis, Missouri</td>
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<tr>
<td>Perez, Rodolfo Nestor Jr.</td>
<td>A.B.</td>
<td>St. Luke's Hospital, St. Louis, Missouri</td>
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<td>Raffin, Steven Bennett</td>
<td>A.B.</td>
<td>Stanford Univ., '64 — Jewish Hospital, St. Louis, Missouri</td>
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<tr>
<td>Reif, Michael Edward</td>
<td>B.S.</td>
<td>Univ. of Tulsa, '65 — University of Oklahoma Hospitals, V.A., Oklahoma City, Oklahoma</td>
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<tr>
<td>Robbins, Philip Leonard</td>
<td>B.A.</td>
<td>Univ. of Southeastern Louisiana, '64 — University of Minnesota Hospitals, Minneapolis, Minnesota</td>
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<tr>
<td>Rodin, Leonard M.</td>
<td>B.S.</td>
<td>Univ. of Wisconsin, '64 — Cedars of Lebanon Hospital, Los Angeles, California</td>
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<tr>
<td>Rothchild, James Goodfriend</td>
<td>B.A.</td>
<td>Wesleyan Univ., '64 — University of Colorado Medical Center, Denver, Colorado</td>
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<tr>
<td>Sayre, Blaine Michael</td>
<td>B.A.</td>
<td>St. Louis Children's Hospital, St. Louis, Missouri</td>
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<tr>
<td>Sayre, Maribeth Prewitt</td>
<td>B.A.</td>
<td>Univ. of Arkansas, '64 — St. Louis Children's Hospital, St. Louis, Missouri</td>
<td></td>
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<tr>
<td>Schade, David Sinclair</td>
<td>B.S.</td>
<td>Davidson Coll., '64 — Jewish Hospital, St. Louis, Missouri</td>
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<tr>
<td>Schilbach, Christhart Siegfried</td>
<td></td>
<td>University of Washington Hospitals, Seattle, Washington</td>
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<tr>
<td>Schneider, Arthur A.B.</td>
<td>Washington Univ., '64 — Michael Reese Hospital, Chicago, Illinois</td>
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</tr>
</tbody>
</table>
Schuckit, Marc Alan, B.S., Univ. of Wisconsin, '65—Cedars of Lebanon Hospital, Los Angeles, California
Schwarz, Paul Russell, A.B., Grinnell Coll., '64—St. Luke's Hospital, St. Louis, Missouri
Shackelford, Gary Dean, B.A., Northwestern Univ., '64—University Hospitals, Cleveland, Ohio
Shackelford, Penelope Greta, B.S., Univ. of Wisconsin, '64—University Hospitals, Cleveland, Ohio
Shillinglaw, John Andrew, B.A., Cornell Coll., '64—University Hospitals, Madison, Wisconsin
Smith, Emily Louise, A.B., Washington Univ., '64—Parkland Memorial Hospital, Dallas, Texas
Stabenow, David Lee, B.S., Univ. of Georgia, '64—Fitzsimons General Hospital (Army), Denver, Colorado
Stover, Andrea, B.A., Univ. of Colorado, '64—Cedars of Lebanon Hospital, Los Angeles, California
Strieff, Larry Gene—Kaiser Foundation, San Francisco, California
Taussig, Lynn Max, A.B., Harvard Coll., '64—Barnes Hospital, St. Louis, Missouri
Thach, Bradley Terrill, A.B., Princeton Univ., '64—St. Louis Children's Hospital, St. Louis, Missouri
Williams, David Lawrence, B.A., Lawrence Coll., '64—Los Angeles County General Hospital, Los Angeles, California
Winkelmann, Jan Zlatkin, A.B., Univ. of Michigan, '64—Los Angeles County General Hospital, Los Angeles, California
Wisperholf, Max Vernon II, B.A., Cornell Coll., '64—Passavant Memorial Hospital, Chicago, Illinois

THIRD-YEAR CLASS (1967-68)
Adams, William Larry—Caldwell, Idaho
Ainsworth, Ann Minehan, A.B., Rosemont Coll., '64—Pelham, New York
Armstrong, John William, Jr., B.S., Univ. of Idaho, '65—Lewiston, Idaho
Baker, John William, Jr.—Kirkwood, Missouri
Barr, John Whitney, A.B., Johns Hopkins Univ., '65—Kirkwood, Missouri
Bates, Thomas Roger—Rigby, Idaho
Becker, Robert Louis, A.B., Cornell Univ., '65—St. Louis, Missouri
Berman, William, Jr., A.B., Harvard Coll., '65—St. Louis, Missouri
Blatt, Philip Mark, A.B., Univ. of Pennsylvania, '65—South Nyack, New York
Busby, Alan Werner, B.S., Univ. of Idaho, '64—Boise, Idaho
Calodney, Leonard, B.S., Grinnell Coll., '65—St. Louis, Missouri
Cowen, Michael Lynn—Fort Morgan, Colorado
Dowell, George Howard, Jr., B.A., Amherst Coll., '60—Baltimore, Maryland
Dunn, Lawrence John, A.B., Stanford Univ., '65—Santa Maria, California
Epstein, James Michael, B.S., Univ. of Notre Dame, '65—Glen Ellyn, Illinois
Farley, James Alan, B.A., Reed Coll., '67—Fullerton, California
Fathman, Charles Garrison, A.B., Univ. of Kentucky, '64—St. Louis, Missouri
Fletcher, Mary Ann, B.S., Univ. of Puget Sound, '65—Olympia, Washington
Freidin, Ralph Baumann, A.B., Columbia Univ., '65—New York, New York
Glenn, William Vincent, Jr., B.A., Johns Hopkins Univ., '65—Falls City, Nebraska
Goldring, Steven Reyburn, B.A., Williams Coll., '65—St. Louis, Missouri
Goodman, Charles Edward, Jr., B.A., Univ. of the South, '65—Decatur, Tennessee
Greener, Donald Joseph, B.S., Allegheny Coll., '65—Harbor Creek, Pennsylvania
Grohle, Robert Edward, B.S., Univ. of Illinois, '65—Barrington, Illinois
Grunow, William Agur, B.A., Valparaiso Univ., '65—Fort Worth, Texas
Hall, Thomas Bryan III, B.A., Univ. of the South, '65—Kansas City, Missouri
Hanking, William Henry, B.S., Univ. of Wyoming, '64—Lander, Wyoming
Haymond, Morey William, A.B., Grinnell Coll., '65—Greeley, Colorado
Heard, Earl David, A.B., Washington Univ., '66—St. Louis, Missouri
Hendrix, Ronald Wayne, A.B., Washington Univ., '65—St. Louis, Missouri
Hersey, Harry Thornton, A.B., Columbia Univ., '65—Chatham, New Jersey
Jacobs, Richard Peter, A.B., Univ. of California, '65—Bellflower, California
Johnson, Val Budge—Ogden, Utah
Karchmer, Richard Kent, A.B., Princeton Univ., '65—Memphis, Tennessee
Kelley, Michael John, B.A., Fresno State Coll., '65—Fresno, California
King, David Michael, B.S., Univ. of Tulsa, '65—Tulsa, Oklahoma
Knuteson, Edward LeeRoy, B.S., Purdue Univ., '65—Blackstone, Illinois
Kolodny, Robert Charles, A.B., Columbia Univ., '65—Scarsdale, New York
Kraetsch, Robert Elroy, B.S., Univ. of Illinois, '65—Peoria, Illinois
Krajcovic, David Paul, A.B., Washington Univ., '65—St. Louis, Missouri
Krauss, David Roy—St. Louis, Missouri
Levy, Michael Theodore, B.A., Queens Coll., '65—Flushing, New York
Lindsey, James Otis II, A.B., Harvard Coll., '65—Waxahachie, Texas
Lipson, Michael Edwin—Toledo, Ohio
Long, John Charles, A.B., Northwestern Univ., '65—Plainview, Texas
Mendelson, Wallace Brand, B.A., Univ. of Texas, '65—Austin, Texas
Moir, George Douglas, A.B., Stanford Univ., '65—San Marino, California
Neubauer, William Nathan, B.S., Univ. of Arizona, '65—Tucson, Arizona
Nevins, Thomas Ernest, A.B., Rockhurst Coll., '65—Rockford, Illinois
Newman, Robert Crouch—Ogden, Utah
Oxenhandler, Donald Craig—St. Louis, Missouri
Parks, Charles Lynwood, B.S. in Med., Univ. of South Dakota, '67—Rapid City, South Dakota
Paul, Robert George, A.B., Washington Univ., '64—St. Louis, Missouri
Ramsey, Roy, Jr., A.B., Univ. of California at Los Angeles, '65—La Crescenta, California
Randall, George Ralph, A.B., Oklahoma City Univ., '65—Elk City, Oklahoma
Rich, Charles Lambert, B.A., DePauw Univ., '65—Covington, Kentucky
Roberts, James Shelton, B.S., Washington State Univ., '65—Richland, Washington
Ross, Jeffrey, A.B., Princeton Univ., '65—St. Louis, Missouri
Russ, Mitchell Allen, B.S., Ohio State Univ., '65—University Heights, Ohio
Samson, Duke Staples, A.B., Stanford Univ., '65—Odessa, Texas
Schroeder, Ronald Lee—Carrollton, Illinois
Schupbach, Curtis Wayne, A.B., Univ. of Missouri, '65—Sedalia, Missouri
Sheridan, John Joseph, B.A., Univ. of Notre Dame, '65—St. Louis, Missouri
Siegel, Barry Alan, A.B., Washington Univ., '66—Chicago, Illinois
Sims, Kenneth Lee—Lubbock, Texas
Smith, Sidney Allen III, B.A., Univ. of Mississippi, '63—Jackson, Mississippi
Smith, William Clifton, B.A., Vanderbilt Univ., '65—Pembroke, Kentucky
Stayton, Conrad Lawrence, Jr., B.S., Southeastern Louisiana College, '64—Hammond, Louisiana
Sullivan, James Andy—St. Charles, Missouri
Swan, Davis McKeen, B.S., Univ. of Wyoming, '63—Riverton, Wyoming
Trotter, John Lee, B.A., DePauw Univ., '65—St. Louis, Missouri
Turner, William George, Jr., B.A., DePauw Univ., '65—Worthington, Ohio
Williams, Paul Roy, B.S., Evangel Coll., '65—Springfield, Missouri
Wintrob, Bruce Urich, A.B., Amherst Coll., '65—Omaha, Nebraska

163
Witztum, Joseph Lee, B.A., Vanderbilt Univ., '65—Madison, Tennessee
Wyatt, Richard Gregory, B.A., Central Methodist Coll., '64—Lebanon, Missouri
Younger, W. B. Jerry—Abilene, Texas
Zopf, David Arnold, A.B., Washington Univ., '64—St. Louis, Missouri

SECOND-YEAR CLASS (1967-68)

Alderson, Philip Otis, A.B., Washington Univ., '66—St. Louis, Missouri
Alex, Neil Steven, B.A., Yale Univ., '66—St. Louis, Missouri
Anderson, Donald Carroll—Fort Collins, Colorado
Atwood, James DeHaven—San Francisco, California
Beamer, Jo Ellen, A.B., Indiana Univ., '66—Altadena, California
Becker, Bruce Harlan, A.B., Washington Univ., '67—St. Louis, Missouri
Bell, John Carl, A.B., Washington Univ., '66—Hobbs, New Mexico
Birns, Robert Isack—Jamaica, New York
Blair, William Edward, Jr., B.S., Indiana Univ., '66—Gary Indiana
Blattner, William Albert, A.B., Washington Univ., '66—Houston, Texas
Brasch, Robert Charles, B.A., Miami Univ., '66—St. Louis, Missouri
Brick, Jeffrey Michael, B.S.E.E., Duke Univ., '66—Prairie Village, Kansas
Brodie, Bruce Rogers, B.S.E.E., Purdue Univ., '65—St. Louis, Missouri
Brueckner, David Armstrong, B.S., Ohio Univ., '66—Miamisburg, Ohio
Burney, Donald Patrick—Corpus Christi, Texas
Campbell, Stephen Edward, A.B., Duke Univ., '66—Graniteville, Vermont
Castellanet, Mark John, B.A., Lawrence Univ., '66—Evergreen Park, Illinois
Chambers, Aubrey Pat, B.A., Univ. of Oklahoma, '66—Muskogee, Oklahoma
Cloninger, Claude Robert, B.A., Univ. of Texas, '66—Beaumont, Texas
Crews, Eugene Lyndon III, A.B., Univ. of Missouri, '66—St. Louis, Missouri
Crofoot, Aaron Brooks, A.B., DePauw Univ., '66—Mishawaka, Indiana
Data, Joann Lucille, B.S., Purdue Univ., '66—West Lafayette, Indiana
Deem, Shirley Klamp, B.S., Washington State Univ., '66—Raymond, Washington
Dickinson, William Hull, B.A., Univ. of Oklahoma, '66—Duncan, Oklahoma
Dierberg, Dale Francis, B.A., Rice Univ., '66—St. Louis, Missouri
Dunlop, Stephen Richard—St. Louis, Missouri
Escobedo, Marilyn Barnard, B.A., Baylor Univ., '66—Torrance, California
Fisher, Bruce David, A.B., Johns Hopkins Univ., '66—Long Branch, New Jersey
Flake, Katheryn Kinlock, A.B., Washington Univ., '66—North Little Rock, Arkansas
Freed, Avery Morton—Sausalito, California
Friesen, Marlyce Kasper, B.A., Tabor Coll., '66—Henderson, Nebraska
Garriga, Francisco Javier, B.S., Univ. of Puerto Rico, '66—Rio Piedras, Puerto Rico
Gaskin, Ronald Jay, A.B., Washington Univ., '66—St. Louis, Missouri
Gumbelevicius, John Peter, A.B., Northwestern Univ., '66—St. Louis, Missouri
Harris, Clifton Gordon, A.B., Stanford Univ., '66—Fresno, California
Hickman, Scott George, A.B., Duke Univ., '66—DeKalb, Illinois
Hieb, Barry Randall, A.B., Bethel Coll., '66—Henderson, Nebraska
Hilliker, Elizabeth, A.B., Washington Univ., '65—St. Louis, Missouri
Ikossi, Maria Georgiou—Nicosia, Cyprus
Kamenetzky, Stephen Allen, A.B., Washington Univ., '67—St. Louis, Missouri
Katz, Jay Alan, B.A., Vanderbilt Univ., '66—Cincinnati, Ohio
Kelley, James Norling, B.S., Univ. of Idaho, '66—Shoshone, Idaho
Kelly, Stephen Euless, B.S., Univ. of Oklahoma, '66—Bartlesville, Oklahoma
Kelsey, Judith Ann—Salt Lake City, Utah
Kotner, Steven Alfred, A.B., Washington Univ., '66—Eldorado, Illinois
Kramer, Morton Earle, A.B., Princeton Univ., '61—Eastport, Maine
Kurz, Larry Stephen, A.B., Washington Univ., '66—Omaha, Nebraska
Larson, Dana, B.A., Macalester Coll., '66—Velva, North Dakota
Lavorgna, Lorenzo Sebastian, A.B., Boston Univ., '66—East Hartford, Connecticut
Lusk, Rodney Hammond, A.B., Duke Univ., '66—Gallipolis, Ohio
MacDonald, Michael John, B.S., Univ. of Notre Dame, '66—Eau Claire, Wisconsin
Macmanus, Quentin, B.S., Univ. of Notre Dame, '66—Bartlesville, Oklahoma
Margul, Betty Lee, A.B., Washington Univ., '66—St. Louis, Missouri
Marshall, Ronald Paul Alfred, B.S., Univ. of Washington, '65—Seattle, Washington
McManus, Thomas Keith, A.B., Columbia Univ., '66—Fort Wayne, Indiana
Mennes, Paul Arthur, B.S., Univ. of Wisconsin, '66—Neenah, Wisconsin
Mick, James Michael, B.S., Univ. of Dayton, '66—Hamilton, Ohio
Milder, Michael Stuart, A.B., Princeton Univ., '66—St. Louis, Missouri
Miller, Alexander Lewis, B.A., Yale Univ., '65—Greenwich, Connecticut
Mollman, Marilyn Agnes, B.A., Northwestern Univ., '66—St. Louis, Missouri
Moreland, John Porter—Lincoln, Nebraska
Okamoto, Gary Akio, B.A., Univ. of Hawaii, '66—Honolulu, Hawaii
Orthals, David William, B.S., St. Louis Univ., '66—St. Louis, Missouri
Palmke, Lyle Douglas, Jr., B.S., Univ. of Texas, '66—Orange, Texas
Pattengale, Paul King, B.S., Boston Coll., '66—Webster Groves, Missouri
Robinson, John Charles—White Plains, New York
Scharp, David William—Columbia, Missouri
Shearer, William Thomas, B.S., Univ. of Detroit, '60; Ph.D., Wayne State Univ., '66—Detroit, Michigan
Simon, Toby Lee, A.B., Johns Hopkins Univ., '66—St. Louis, Missouri
Simpson, Paul Cooper, Jr., A.B., Davidson Coll., '66—Nashville, Tennessee
Smith, Richard Lee, B.S., St. Louis Univ., '66—Wood River, Illinois
Snyder, Rush Alexander, Jr., B.A., Rice Univ., '66—Canadian, Texas
Stanton, William III, A.B., Harvard Coll., '65—Athens, Kansas
Stern, Peter Joseph, B.A., Williams Coll., '66—Cincinnati, Ohio
Summers, William Koopmans, A.B., Univ. of Missouri, '66—Jefferson City, Missouri
Sumner, Hatton William, B.S., St. Edwards Univ., '66—West, Texas
Swenson, Keith Howard, B.S., Univ. of Idaho, '66—Rockford, Illinois
Throop, George Reeves III, B.A., Hanover Coll., '66—St. Louis, Missouri
Tuttle, William Montgomery, B.A., Indiana Univ., '66—Owensville, Kentucky
Udesky, Robert Alan, A.B., Oberlin Coll., '66—Winnetka, Illinois
Wood, Dennis Edward—Rocheport, Missouri
Zurbrugg, Eric Brinton, B.S., U.S. Air Force Academy, '65—Zanesville, Ohio

FIRST-YEAR CLASS (1967-68)

Addison, Rita Marie, B.S., Purdue Univ., '67—Carthage, Indiana
Anderson, Dixie Jane, B.A., Hendrix Coll., '67—Springdale, Arkansas
<table>
<thead>
<tr>
<th>Name</th>
<th>Degree(s)</th>
<th>Institution</th>
<th>City, State</th>
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<tbody>
<tr>
<td>Anderson, Kathleen W.</td>
<td>B.S., Butler Univ.</td>
<td>'67—Indianapolis, Indiana</td>
<td></td>
</tr>
<tr>
<td>Aronberg, Jerome M.</td>
<td>A.B., Washington Univ.</td>
<td>'67—St. Louis, Missouri</td>
<td></td>
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<tr>
<td>Beasley, Clifton H.</td>
<td>A.B., Stanford Univ.</td>
<td>'67—Fort Worth, Texas</td>
<td></td>
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<tr>
<td>Beechie, Carla A.</td>
<td>B.A., Univ. of Texas</td>
<td>'67—Mexico City, D.F., Mexico</td>
<td></td>
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<tr>
<td>Berger, Jack E.</td>
<td>B.A., Indiana Univ.</td>
<td>'66—Mishawaka, Indiana</td>
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<tr>
<td>Berrier, Jane E.</td>
<td>B.S., Arizona State Univ.</td>
<td>'67—Scottsdale, Arizona</td>
<td></td>
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<tr>
<td>Blake, Robert L.</td>
<td>A.B., Duke Univ.</td>
<td>'67—Durham, North Carolina</td>
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<td>Blanke, Thomas J.</td>
<td>A.B., Rockhurst Coll.</td>
<td>'67—St. Louis, Missouri</td>
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<td>Blath, Richard A.</td>
<td>University City, Missouri</td>
<td></td>
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<td>Blevins, William L.</td>
<td>B.S., Coll. of Idaho</td>
<td>'67—Weiser, Idaho</td>
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<tr>
<td>Bloom, Marshall E.</td>
<td>A.B., Washington Univ.</td>
<td>'67—Dallas, Texas</td>
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<td>Brown, Richard A.</td>
<td>A.B., Stanford Univ.</td>
<td>'67—Chicago, Illinois</td>
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<td>Bushby, James B.</td>
<td>B.A., Wesleyan Univ.</td>
<td>'67—St. Louis, Missouri</td>
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<td>Carnesale, Sandra A.</td>
<td>A.B., Univ. of Michigan</td>
<td>'62—New York, New York</td>
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<td>Cassell, Sidney L.</td>
<td>A.B., Univ. of Michigan</td>
<td>'67—Tunica, Mississippi</td>
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<td>Clamon, Gerald H.</td>
<td>West Hartford, Connecticut</td>
<td></td>
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<td>Clark, Edward C.</td>
<td>B.S., Purdue Univ.</td>
<td>'67—Cheverly, Maryland</td>
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<td>Cleary, Thomas G.</td>
<td>B.S., St. Louis Univ.</td>
<td>'67—St. Louis, Missouri</td>
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<tr>
<td>Cohen, Alan R.</td>
<td>B.A., Vanderbilt Univ.</td>
<td>'61; M.A., '61; B.D., Harvard Univ.</td>
<td>'67—Nashville, Tennessee</td>
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<tr>
<td>Conway, Oren M.</td>
<td>A.B., Univ. of Michigan</td>
<td>'67—Munster, Indiana</td>
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<td>Cooper, Dennis C.</td>
<td>St. Louis, Missouri</td>
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<td>Cottiggin, Joseph L.</td>
<td>A.B., St. Louis Univ.</td>
<td>'67—Sikeston, Missouri</td>
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<td>Crissie, Michael M.</td>
<td>A.B., Colorado State Coll.</td>
<td>'67—Littleton, Colorado</td>
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<td>Daughaday, Carlos C.</td>
<td>A.B., Harvard Coll.</td>
<td>'67—San Diego, California</td>
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<td>DeJohn, James P.</td>
<td>B.S., Loyola Univ.</td>
<td>'67—St. Louis, Missouri</td>
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<td>Diedrichsen, David L.</td>
<td>—Sparks, Nevada</td>
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<td>Doyle, Lucy E.</td>
<td>B.A., Rice Univ.</td>
<td>'67—Houston, Texas</td>
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<td>Eggebrecht, Russell E.</td>
<td>B.S., Univ. of Illinois</td>
<td>'67—Staunton, Illinois</td>
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<td>Eiser, Thomas J.</td>
<td>—Gardena, California</td>
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<td>Ferguson, Ronald M.</td>
<td>B.A., Augsburg Coll.</td>
<td>'67—Milaca, Minnesota</td>
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<td>Friedman, Charles A.</td>
<td>A.B., Princeton Univ.</td>
<td>'67—Memphis, Tennessee</td>
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<td>Friesen, Arthur D.</td>
<td>B.A., Tabor Coll.</td>
<td>'65; M.A., Univ. of Kansas '67—Yarrow, British Columbia, Canada</td>
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<td>Gephart, Gordon N.</td>
<td>—Muskogee, Oklahoma</td>
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<td>Goldstein, Paul D.</td>
<td>B.S., Massachusetts Institute of Technology</td>
<td>'67—New Orleans, Louisiana</td>
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<td>Harris, John J.</td>
<td>B.A., Johns Hopkins Univ.</td>
<td>'67—Arlington, Texas</td>
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<td>Herzman, Phillip A.</td>
<td>B.A., Washington Univ.</td>
<td>'67—St. Louis, Missouri</td>
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<td>Hill, Thomas C.</td>
<td>B.S.Ch.E., Purdue Univ.</td>
<td>'67—Gary, Indiana</td>
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<td>Johnson, Gregory L.</td>
<td>B.A., Northwestern Univ.</td>
<td>'67—Virginia, Minnesota</td>
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<td>Johnson, James H.</td>
<td>B.S., Southern Methodist Univ.</td>
<td>'67—Casey, Illinois</td>
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<td>Kaiser, Charlene B.</td>
<td>B.A., Univ. of Colorado</td>
<td>'67—Palatine, Illinois</td>
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<td>Keller, Harrison B.</td>
<td>—Falls Church, Virginia</td>
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<td>Kowaloff, Edward M.</td>
<td>A.B., Univ. of Rochester</td>
<td>'67—West Orange, New Jersey</td>
<td></td>
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<td>Laibovitz, Robert A.</td>
<td>A.B., Washington Univ.</td>
<td>'67—Austen, Texas</td>
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<td>Lembeck, Lance J.</td>
<td>A.B., San Diego State Coll.</td>
<td>'67—San Diego, California</td>
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<tr>
<td>Levy, Robert M.</td>
<td>B.A., New York Univ.</td>
<td>'65; M.S., '66—Sunnyside, New York</td>
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<td>Ludwig, Barry I.</td>
<td>A.B., Washington Univ.</td>
<td>'67—St. Louis, Missouri</td>
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<td>Mayfield, Douglas E.</td>
<td>A.B., Harvard Coll.</td>
<td>'67—St. Louis, Missouri</td>
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166
Merrell, David Marx—Wabash Coll., '67—Evansville, Indiana
Merritt, Joe Paul—Oklahoma City, Oklahoma
Moscoe, Newton Dee—Norman, Oklahoma
Noller, David William—St. Louis, Missouri
Nugent, Kenneth Michael, B.A., Univ. of Texas, '67—Sugar Land, Texas
Oda, James Edward, A.B., Georgetown Univ., '67—Honolulu, Hawaii
Peden, Joseph Carroll III, A.B., Colgate Univ., '67—St. Louis, Missouri
Phelan, Elna Therene, B.A., Pomona Coll., '67—La Mesa, California
Potkin, Steven Garth—Lincolnwood, Illinois
Prest, Michael Lynn, B.S., Univ. of San Francisco, '66—San Francisco, California
Quillin, William Henry, A.B., Washington Univ., '67—San Diego, California
Richman, Edward Merle, B.S., Massachusetts Institute of Technology, '67—Cleveland Heights, Ohio
Rigg, Lee Allen, B.A., Arizona State Univ., '61; Ph.D., Univ. of Colorado, '65—Tempe, Arizona
Roberts, William Virgil, Jr.—Columbus, Ohio
Rose, Edward Phillip, B.S., Univ. of Notre Dame, '67—St. Louis, Missouri
Ross, Miriam—Lakewood, New Jersey
Rouse, Ernest Tuttle, A.B., Princeton Univ., '67—St. Louis, Missouri
Rubenstein, Morton Jerome, B.A., Johns Hopkins Univ., '67—Baltimore, Maryland
Ryan, Thomas Edwards, B.S.C.E., Southern Methodist Univ., '67—North Little Rock, Arkansas
Saltzman, Stephen James, B.S., Tulane Univ., '67—Tucson, Arizona
Schreiner, Richard Lawrence, B.S., St. Louis Univ., '67—Hammond, Indiana
Schwarz, Kathleen Brogan, B.A., Scripps Coll., '64; M.A., Univ. of Missouri, '65—St. Louis, Missouri
Seale, Robert Holt, B.S., Univ. of Idaho, '67—Moscow, Idaho
Shapiro, Larry Jay—Skokie, Illinois
Shaw, James Thomas, B.A., Westminster Coll., '67—Hermann, Missouri
Simpson, Robert Marshall, B.S., Univ. of Wisconsin, '67—Sheboygan, Wisconsin
Sneid, David Sabara, A.B., Stanford Univ., '67—Shawnee Mission, Kansas
Spiegel, Gregory W., A.B., Washington Univ., '67—Kirkwood, Missouri
Stenson, William Frederick, B.S., Providence Coll., '67—Levittown, New York
Stephens, Robert Frederic, B.S., Univ. of Oklahoma, '67—Lawton, Oklahoma
Stephenson, Gary Sherman, B.A., Univ. of Oklahoma, '67—Oklahoma City, Oklahoma
Swartout, Michael A.B., Stanford Univ., '67—Temple City, California
Taylor, Stever John, A.B., Stanford Univ., '67—Mexico, Missouri
Teffer, James Gavin, Jr.—Wilmette, Illinois
Thorne, David Lee, A.B., Indiana Univ., '67—Fort Wayne, Indiana
Uhlemann, John Hosley, A.B., Grinnell Coll., '67—Lake Forest, Illinois
Warnke, Roger Allen, B.S., Univ. of Illinois, '67—Peoria, Illinois
Weiner, Allen Benjamin, Pharm.D., Univ. of Southern California at Los Angeles, '65—Los Angeles, California
Weisenberger, Anthony Joseph, B.S., St. Louis Univ., '67—Chillicothe, Ohio
Wellauer, Robert Edward, B.S., Univ. of Wisconsin, '67—Wauwatosa, Wisconsin
West, Ulla Christina, A.B., Univ. of California at Riverside, '67—Redlands, California
Wharton, Thomas Parker, Jr., B.S., Yale Univ., '67—Neenah, Wisconsin
Wong, Winslow Hung Chung, A.B., Washington Univ., '67—Honolulu, Hawaii
Zimmermann, George Jay, B.S., Texas Wesleyan Coll., '67—Fort Worth, Texas
<table>
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<td>Fourth-Year Class</td>
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<td>Third-Year Class</td>
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<td>Second-Year Class</td>
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<td>First-Year Class</td>
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<td>Total</td>
<td>352</td>
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ASSISTANTS, FELLOWS, AND TRAINEES 1967-68

Abramowitz, Harry B., Assistant in Surgery
Adams, James E., Assistant and Trainee (NIMH) in Psychiatry
Adatepe, Mustafa H., Mallinckrodt Fellow in Radiology (Nuclear Medicine)
Ager, Phyllis Jean, Research Assistant in Pharmacology
Ainsworth, Robert P., Assistant in Medicine
Albright, Phillip H., Trainee (NIAMD) in Medicine (Dermatology)
Alexander, Ronald W., Senior Trainee (NIGMS) in Experimental Pathology
Allen, Marlys K., Assistant in Speech Correction in Child Psychiatry
Alving, Carl R., Assistant in Medicine
Alvord, Douglas W., Assistant in Medicine
Anderson, Carl W., Trainee (NIAID) in Microbiology
Anderson, Charles B., Assistant in Surgery
Andrews, Jeannine O., Research Assistant in Medical Psychology in Psychiatry
Apelbaum, Jose, Research Assistant in Biochemistry in Psychiatry
Arango, Gonzalo, Trainee (NHI) in Medicine (Cardiology)
Aras, Erturan, Research Assistant in Neurological Surgery
Armstrong, John D., Assistant in Radiology
Atcheson, James Bruce, Assistant in Medicine
Attardi, Domenica, Special Trainee (NIAID) in Microbiology
Attias, Joseph James, Visiting Postdoctoral Fellow in Microbiology
Badri, Hossein, Assistant in Pathology
Bahl, Om Parkash, Fellow in Medicine (Cardiology)
Bahn, Barbara Ann, Research Assistant in Psychiatry
Baietto, Edward B., Jr., Assistant in Medicine
Baker, Max Alden, Assistant and Trainee (NIMH) in Psychiatry
Bardsley, John L., Assistant in Radiology
Bartlett, Hugh C., Assistant in Surgery
Bass, Larry J., Research Assistant in Medical Psychology
Bauer, Eugene A., Assistant in Medicine
Baxt, Paul, Assistant in Surgery
Beideman, Larry R., Research Fellow and Research Trainee (NIMH) in Medical Psychology
Bell, Clarence E., Jr., USPHS Special Fellow in Preventive Medicine
Berg, Edward F., Assistant in Ophthalmology
Berger, Nathan A., Assistant in Medicine
Bergsma, Donald, Assistant in Ophthalmology (on leave of absence)
Berryhill, Bruce H., Assistant and Fellow (NINDS) in Otolaryngology
Bessone, Luis N., Fellow and USPHS Senior Clinical Trainee in Thoracic and Cardiovascular Surgery
Bhend, David P., Assistant in Medicine
Bigger, John F., Jr., Assistant in Ophthalmology (on leave of absence)
Bilchik, Ronald C., Assistant in Medicine
Bilsel, Zeliha, Assistant in Pediatrics
Bin, Joo W., Fellow in Plastic Surgery
Birge, Claire H., Predoctoral Trainee (NIGMS) in Biological Chemistry
Birge, Stanley J., Jr., Trainee (NIAMD) in Medicine (Metabolism)
Birnberger, Karl L., Assistant in Neurology
Bisno, David C., Assistant in Ophthalmology
Blaine, G. James III, Research Assistant in the Biomedical Computer Laboratory
Blehm, Delores, Research Assistant in Pharmacology
Bliznak, Johnny, Assistant in Surgery
Blumenthal, Harvey J., Assistant and Fellow (NINDB) in Neurology
Boelling, Gary Mack, Trainee (NHI) in Medicine (Cardiology)
Boellner, Samuel William, USPHS Special Fellow in Neurology in Pediatrics, Instructor in Pediatrics, and Clinical Fellow in Neurology
Boetto, John C., Assistant in Surgery
Bofing, Mary K., Assistant in Pediatrics
Bohigian, George M., Assistant and Fellow (NINDB) in Ophthalmology
Boime, Irving, Predoctoral Fellow and Trainee (NIGMS) in Pharmacology
Boustanian, Parly, Assistant in Pediatrics
Boyd, William J., Jr., Assistant in Pathology and Trainee (NIGMS) in Experimental Pathology
Bradfield, John S., Assistant in Radiology
Brauner, Gary J., Assistant in Medicine
Bremer, David A., Research Assistant in Medical Psychology
Bridges, Sandra H., Trainee (NIAID) in Microbiology
Brion, Patcell E., Assistant in Psychiatry
Brock, David C., Assistant in Pediatrics
Brodsky, Alan L., Assistant in Medicine
Broido, Peter W., Assistant in Surgery
Brown, Barbara N., Assistant in Medicine (Dermatology)
Brown, Howard S., Fellow in Thoracic and Cardiovascular Surgery
Brown, Joseph G., Research Assistant in Pharmacology
Brown, Richard M., Assistant in Ophthalmology
Brownson, Richmond J., Assistant and Fellow (NINDB) in Otolaryngology
Brunner, John H., Assistant in Surgery
Buchbinder, Judith W., Research Assistant in Child Psychiatry
Burgham, Rebecca J., Research Assistant in Pathology
Burd, Ronald Marshall, Assistant and Fellow (NINDB) in Ophthalmology
Burger, Robert L., Assistant in Medicine
Bussaritid, Sompon, Assistant in Psychiatry
Buyukdevrim, A. Sevim, Trainee (NIAMD) in Preventive Medicine

Cadoret, Remi Jere, Assistant and Trainee (NIMH) in Psychiatry
Calcaterra, Thomas C., Assistant and Fellow (NINDB) in Otolaryngology
Camenga, David Leroy, Assistant and Fellow (NINDB) in Neurology
Cantwell, Dennis P., Assistant and Trainee (NIMH) in Psychiatry
Carter, Henry M., Assistant and Fellow (NINDB) in Otolaryngology
Carl, Juanita L., Research Assistant in Biochemistry in Psychiatry
Carnighan, Robert H., Assistant in Medicine
Carr, Charles D., Research Assistant in Otolaryngology
Carspecken, H. H., Jr., Assistant in Surgery
Casey, Elliot C., Assistant in Pediatrics
Caspari, Richard B., Assistant in Surgery
Cassisi, Elayne E., Assistant and Trainee (NIMH) in Psychiatry
<table>
<thead>
<tr>
<th>Name</th>
<th>Role and Program</th>
<th>Department</th>
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<tbody>
<tr>
<td>Cassisi, Nicholas J.</td>
<td>Assistant and Fellow (NINDB)</td>
<td>Otolaryngology</td>
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<tr>
<td>Castellucci, Vincent</td>
<td>Fellow (NINDB)</td>
<td>Neurology</td>
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<td>Cayabyab, Pedro C.</td>
<td>Assistant in Psychiatry</td>
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<tr>
<td>Ceballos, Nelson</td>
<td>Fellow in Psychiatry</td>
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<td>Cehreli, Cavit</td>
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<td>Cibis, Michael</td>
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</tbody>
</table>
Duggins, Oliver H., Research Assistant in Anatomy
Duncan, James M., Assistant in Medicine
Dunner, David L., Assistant and Trainee (NIMH) in Psychiatry

Ebaugh, Irvin A., Jr., Assistant and Trainee (NIMH) in Child Psychiatry
Eby, Dave H., Assistant in Medicine (on leave of absence)
Edwards, James Earl, Assistant and Trainee (NIMH) in Child Psychiatry
Ehrlich, Carl F., Jr., Assistant in Otolaryngology
Eikman, Edward Allan, Assistant in Medicine
Elfers, Nancy C., Research Fellow and Research Trainee (NIMH) in Medical Psychology
Elkan, Ivan O., Fellow in Medicine (Renal Diseases)
Ellerman, Jeanette E., Research Assistant in Pharmacology
Ellingson, F. Thomas, (NINDB) Special Fellow in Ophthalmology
Ellis, Stephen S., II, Assistant in Surgery
Ellsasser, James C., Assistant, Fellow, and Trainee (NIAMD) in Orthopedic Surgery
Elovson, John, Postdoctoral Fellow in Biological Chemistry
Emerson, James D., Assistant in Surgery
Engebretson, Adolph M., Research Assistant in the Biomedical Computer Laboratory
Engel, Margaret E., Trainee (NIAID) in Microbiology
England, James M., Trainee (NIGMS) in Anatomy
Escriu, Jose Marie, Research Assistant in Biochemistry in Psychiatry
Estherhuizen, Andries C., Research Assistant in Pathology
Evans, Ronald G., Assistant in Radiology
Evert, Donna L., Assistant in Education in Child Psychiatry
Ezekiel, Rivka, Assistant in Psychiatric Social Work in Child Psychiatry

Farah, Elie, Fellow in Ophthalmology
Farran, Ronald Denis, Assistant in Medicine
Faulkner, Wade, Assistant in Ophthalmology
Feagler, John R., Assistant in Medicine
Feighner, John P., Assistant and Trainee (NIMH) in Psychiatry
Feldman, Martin H., Assistant and (NINDB) Special Fellow in Neurology
Fenlon, John W., Assistant in Radiology
Ferrier, Raymond W., Research Assistant in Medicine
Fertel, Richard H., Trainee (NSF) in Pharmacology
Finke, Edward H., Research Assistant in Pathology
Finley, Dennis, Assistant in Orthopedic Surgery
Fischer, John R., Assistant and Trainee (NIMH) in Psychiatry
Fishman, Marvin A., USPHS Special Fellow in Neurology in Pediatrics, Instructor in Pediatrics, and Clinical Fellow in Neurology
Ford, Richard J., Trainee (NIGMS) in Experimental Pathology
Fouche, L. E., Assistant in Surgery (Anesthesiology)
Franken, Edmund A., Jr., Trainee (NINDB) in Neuroradiology
Freking, Marianne G., Predoctoral Fellow and Trainee (NIGMS) in Pharmacology
Friedman, Howard S., Assistant in Medicine
Fritzhand, Martin D., Assistant in Medicine
Fuqua, Joseph T., Assistant in Medicine

Galakotos, Andrew E., Assistant in Obstetrics and Gynecology
Garcia, Francisco, Fellow in Ophthalmology
ASSISTANTS, FELLOWS, AND TRAINEES

Gass, Michael, Trainee (NIAMD) in Medicine (Dermatology)
Gay, Michael H., Predoctoral Fellow and Trainee (NIGMS) in Pharmacology
George, Philip G., Assistant in Surgery
Gibbons, Martha Jane, Research Assistant in Pharmacology
Gibbons, W. Ray, Research Assistant in Medicine
Gibson, Walter Bruce, Predoctoral Trainee (NIGMS) in Biological Chemistry
Gilbert, Alfred, Assistant in Medicine
Gilpin, Doris C., Assistant in Child Psychiatry, Instructor in Clinical Child Psychiatry
Glaser, Donald Harold, Research Assistant in the Biomedical Computer Laboratory
Glatzleider, Paul E., Assistant in Surgery
Gloor, Balder P., Fight for Sight Fellow of the National Council to Combat Blindness in Ophthalmology
Gogo, Prospero B., Assistant in Pediatrics
Goldwyn, Robert H., Fellow in Ophthalmology
Goltz, Theodore H., Research Assistant in Medical Psychology in Child Psychiatry
Gondring, William H., Assistant in Orthopedic Surgery
Goodwin, Donald W., Research Fellow in Psychiatry
Goodwin, Sally Lee, Research Assistant in Biochemistry in Psychiatry
Gordon, Stanley L., Assistant in Surgery (on leave of absence)
Goreish, Abdullahi S.A., Fellow in Ophthalmology
Gorenley, Daniel Eugene, Assistant in Medicine (Dermatology)
Gorell, Jay Michael, Assistant in Medicine
Gowda, Molle Bore, Assistant in Pediatrics
Green, Kenneth Otto, Fellow in Ophthalmology
Green, Morton Robert, Fellow in Ophthalmology
Greenspan, Michael D., Postdoctoral Fellow in Biological Chemistry
Greider, Marie, Research Fellow in Experimental Pathology
Grey, Neil J., Trainee (NIAMD) in Medicine (Metabolism)
Grubb, Robert L., Jr., Assistant in Surgery (on leave of absence)
Guilhen, Rodolfo T., Trainee (NIAMD) in Medicine (Gastroenterology)
Gurgo, Corrado, Research Fellow in Microbiology
Gurwitz, David, Research Assistant in the Biomedical Computer Laboratory
Haas, Lawrence M., Fellow and Trainee (NIAMD) in Orthopedic Surgery
Haff, Roderick C., Assistant in Surgery
Halford, Richard M., Assistant in Surgery
Halikas, James, Assistant and Trainee (NIMH) in Psychiatry
Hall, Dennis C., Predoctoral Trainee (NIAID) in Microbiology
Halpern, Barry L., Assistant in Medicine
Halverson, John D., Assistant in Surgery
Harbord, Newton J., Assistant in Medicine
Harkonen, Matti, USPHS International Postdoctoral Fellow in Pharmacology
Harris, Bernard L., Assistant and Fellow (NINDB) in Otolaryngology
Harris, Joel Robert, Research Assistant in Medical Psychology in Child Psychiatry
Harrison, Hall E., Assistant in Medicine (on leave of absence)
Harter, Herschel R., Assistant in Medicine
Hashimoto, Inoru, Research Assistant in Obstetrics and Gynecology
Hause, Margie E., Research Assistant in Surgery
Hayes, Margaret L., Assistant in Obstetrics and Gynecology
Hecht, Julius, Research Assistant in Radiology

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THE SCHOOL OF MEDICINE

Heilbrun, Mark P., Assistant in Neurological Surgery
Held, Carl P., Assistant and Trainee (NIMH) in Psychiatry
Henry, Joyce I., Research Assistant in Microbiology
Herman, Dan, Assistant in Surgery
Hill, Rexford Lee III, Research Assistant in the Biomedical Computer Laboratory
Hill, Shirley Y., Research Fellow and Research Trainee (NIMH) in Medical Psychology
Hilleboe, John W., Assistant in Orthopedic Surgery
Hirschfeld, David S., Assistant in Medicine
Ho, Se-Key, Research Assistant and Research Trainee (NIMH) in Psychiatry
Hoffman, Marlene R., Assistant in Medical Psychology and Trainee (NIMH) in Clinical Psychology in Child Psychiatry
Hoffmeister, Willy, Assistant in Child Psychiatry
Hoffsten, Phillip E., Trainee (NIAMD) in Medicine (Renal Diseases)
Holliday, James A., Assistant and Fellow (NINDB) in Otolaryngology
Holman, B. Leonard, Assistant in Radiology
Holmes, William F., Research Assistant in the Biomedical Computer Laboratory
Holtzschuer, George, Research Assistant in Otolaryngology
Holzer, Michael E., Assistant in Radiology
Horner, William, Assistant in Pediatrics
Hosoda, Saichi, Research Assistant in Gerontology
Howard, Phillenore A., USPHS Predoctoral Fellow in Biological Chemistry
Howell, Simon L., Eli Lilly Postdoctoral Fellow in Experimental Pathology
Howesden, Floyd Lester, Assistant in Medicine
Howesden, Susan Mayse, Assistant in Medicine
Hsu, A Chuen, Assistant in Pediatrics
Hsu, Priscilla Liang, Assistant in Psychiatric Social Work in Child Psychiatry
Hurwitz, Camilla, Postdoctoral Fellow in Radiology
Irwin, Thomas M., Assistant in Otolaryngology
Jackson, Raymond, Research Assistant in Pathology
Jacobs, Katherine M., Assistant in Radiology
Jacobs, Laurence S., Trainee (NIAMD) in Medicine (Metabolism)
Jaffee, Bernard M., Fellow and Trainee (NIGMS) in Surgery
Jahanian, Daryoush, Assistant in Obstetrics and Gynecology
Jaramillo, Jaime, Assistant in Child Psychiatry
Jeffrey, Peter Lyall, Research Fellow in Biological Chemistry
Jobin, Gary C., Assistant in Medicine
Joffe, William Steven, Research Fellow in Ophthalmology
Johnson, Charles A., Assistant in Surgery
Johnson, Noel M., Assistant and Trainee (NIMH) in Psychiatry
Jordon, Clifford G., Research Assistant in Medical Psychology in Psychiatry
Jungalwala, Firoze, Research Assistant in Biochemistry in Psychiatry
Kadin, Marshall E., Assistant in Pathology and Trainee (NIGMS) in Experimental Pathology
Kahn, Leonard B., Assistant in Pathology (Surgical Pathology)
Kanam parchment, Fellow in Ophthalmology
Kanagawa, Harold, Assistant in Medicine
Kao, Ming-Shian, Assistant in Obstetrics and Gynecology
Kaplan, Jerome H., Assistant in Radiology

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<th>Title/Role</th>
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Levinsky, Richard A., Assistant in Medicine
Levisohn, Steven R., Assistant in Medicine
Leviton, Alan, Assistant and Fellow (NINDB) in Neurology
Levitt, Philip, Assistant in Surgery
Leyton, Orlando, Research Fellow in Otolaryngology
Limthong, Puntawee, Fellow in Medicine (Gastroenterology)
Ling, Walter, Assistant and Fellow (NINDB) in Neurology
Llewellyn, Henry J., Assistant in Radiology
Loewenstein, Joseph Edward, Assistant in Medicine
Logie, Macdonald Bruce, Assistant in Medicine
Londe, Stephen P., Assistant, Research and Clinical Fellow in Surgery, USPHS Postdoctoral Fellow in Physiology and Biophysics, and Fellow in Medicine (Cardiology)
Long, Walter E., Research Assistant in the Biomedical Computer Laboratory
Lovejoy, William M., Assistant and Trainee (NIMH) in Psychiatry
Lowenbraun, Stanley, Assistant in Medicine
Lowe, George, Fellow (NINDB) in Ophthalmology
Luce, Edward A., Assistant in Surgery
Lynch, Richard G., Assistant in Pathology and Trainee (NIGMS) in Experimental Pathology
Lyskowski, Maria, Assistant and Trainee (NIMH) in Psychiatry
Macias-Godinez, E., Assistant in Pediatrics
Mackey, Richard L., Assistant and Clinical Fellow in Genitourinary Surgery
Magidson, Daniel T., Research Assistant in Child Psychiatry
Majur, Oscar L., Jr., U. S. Navy Fellow in Plastic Surgery
Maley, Edward D., Assistant in Surgery
Maltz, Robert, Assistant and Fellow (NINDB) in Otolaryngology
Manfredi, Mario, Fellow (NINDB) in Neurophysiology
Marique, Julio P., Assistant in Medicine (Dermatology)
Manson, Donald J., Research Assistant in the Biomedical Computer Laboratory
Maritz, Ida K., Research Assistant in Medicine
Marmet, Ruben, Assistant in Obstetrics and Gynecology
Martin, Sue, Assistant and Trainee (NIMH) in Psychiatry
Martin, Gerry David, Assistant in Medicine
Martz, David C., American Cancer Society Fellow in Medicine (Hematology) and Trainee (NIAMD) in Medicine (Hematology)
Masden, Ronald R., Trainee (NHI) in Medicine (Cardiology)
Massie, Henry Norton, Assistant in Medicine
Matlof, Harvey J., Assistant in Medicine
Matulef, Norman Jay, Assistant in Medical Psychology in Child Psychiatry
Maurice, William L., Assistant in Psychiatry
Mayer, John H., III, Assistant in Surgery
Mayes, Ben R., Jr., Assistant in Radiology
Mayhall, C. Glen, Assistant in Medicine
McBrayer, Reuben H., Jr., Assistant in Medicine
McCown, Allan H., Assistant in Radiology
McDonald, Michael Dene, Research Assistant in the Biomedical Computer Laboratory
McGhee, Richard D., Assistant and Clinical Fellow in Genitourinary Surgery
McKeel, Daniel W., Assistant in Pathology and Trainee (NIGMS) in Experimental Pathology
McKnight, Charles Allen, Assistant in Obstetrics and Gynecology
McLean, Anne, Postdoctoral Fellow in Biological Chemistry
McNamee, Mary J., Research Assistant in Orthopedic Surgery
Meinhardt, Lucile Pat, Research Assistant in Pharmacology
Mejia, Hugo, Assistant and Fellow (NINDB) in Neurology
Mell, Roger L., Assistant in Orthopedic Surgery
Mellies, Margot, Assistant in Pediatrics
Meltzer, Gerald E., Assistant and Fellow (NINDB) in Ophthalmology
Merideth, Charles H., Assistant and Trainee (NIMH) in Psychiatry
Merren, Michael D., Assistant in Medicine
Metzger, Judith M., Research Assistant in Radiology
Michaelides, Maria, Research Fellow in Biological Chemistry
Middleton, Jerry N., Assistant in Obstetrics and Gynecology
Miller, Carol Ann, Assistant in Pathology and Trainee (NIGMS) in Experimental Pathology
Miller, James V., Assistant in Medicine
Miller, Richard B., Assistant in Medicine
Miller, Rosalie E., Research Assistant in Psychiatry
Modlin, Barry, Assistant and Fellow (NINDB) in Otolaryngology
Mohyuddin, Sadiq, Assistant in Medicine
Moon, Young Ho, Fellow in Medicine (Cardiology)
Moonsammy, George I., Research Fellow and Research Trainee (NIMH) in Medical Psychology in Psychiatry
Moor, William A., Assistant in Ophthalmology
Mora, Virgil Antonio, Assistant and Fellow (NINDB) in Neurology
Morgan, Loren R., U. S. Army Fellow in Plastic Surgery
Morris, James C., III, Assistant in Surgery
Moses, Sylvia G., Research Assistant in Psychiatry
Munoz, Rodrigo, Fellow in Psychiatry
Murrell, Hugh J., Assistant in Radiology
Myers, Paul R., Research Assistant in Anatomy
Narins, Robert Gerald, USPHS Postdoctoral Fellow in Pharmacology
Nathan, Lester J., Assistant in Clinical Surgery
Neiberg, Frank, Assistant in Pediatrics
Newberry, W. Marcus, Jr., Assistant in Medicine
Newmark, Leonard N., Trainee (NIAID) in Medicine (Infectious Diseases)
Noble, Robert G., Assistant and Clinical Fellow in Genitourinary Surgery
Nolle, Floyd Martin, Research Assistant in the Biomedical Computer Laboratory
Nord, Heinz Juergen, Assistant and Research Fellow in Medicine (Gastroenterology)
Norman, Harold G., Jr., Fellow in Plastic Surgery
O'Flaherty, Juan Jose, Fellow (NINDB) in Neurology
Oftedal, Gunnar, Assistant in Neurology
Ohnishi, Toshio, Research Fellow in Otolaryngology
Okada, Yasuhiro, Postdoctoral Fellow in Pharmacology
O'Leary, Lawrence R., Research Assistant in Medical Psychology in Child Psychiatry
Ollada, Miguel, Assistant in Pediatrics
Olney, John William, Research Assistant and Research Trainee (NIMH) in Psychiatry
Olson, Judith G., Research Assistant in Radiology
Orr, William C., Research Fellow and Research Trainee (NIMH) in Medical Psychology
Oscail, Lawrence B., Trainee (NIAMD) in Preventive Medicine
Ospina, Leonel, Research Fellow and Fern Waldman Fellow in Pediatrics
Ott, Thomas F., Assistant in Ophthalmology

Pagta Khan, Reynaldo D., Research Fellow in Pediatrics (Cardiology)
Palafox, Roberto A., Assistant in Pathology
Palmer, E. Prater, Jr., Assistant in Medicine
Palmer, Kalman M., Research Assistant in Radiology
Pannbacker, Richard G., Fellow (NINDB) in Pharmacology
Pardo, Waldo E., Assistant and Trainee (NIMH) in Child Psychiatry
Patterson, James H., Research Assistant in Radiology
Patrizi, Gianfranco, Children’s Research Foundation Research Fellow in Pediatrics (Infectious Diseases)
Peake, Glenn T., Trainee (NIAMD) in Medicine (Metabolism), Instructor in Pediatrics, and Instructor in Medicine
Pearlstein, Richard C., Research Assistant in Psychology in Psychiatry
Pernice, Joyce, Assistant in Medicine
Pernice, Nicholas, Assistant in Medicine
Petit, Roland, Research Fellow in Surgery
Petty, Jerry M., Fellow and Trainee (NINDB) in Neurological Surgery
Petzel, Thomas P., Research Assistant in Medical Psychology in Psychiatry
Pfaff, David A., Assistant in Medicine
Phillips, Stephen L., Postdoctoral Trainee (NIAID) in Microbiology
Pokorny, Gert, Assistant in Obstetrics and Gynecology
Posadas Del Rio, F., OAS Predoctoral Fellow in Pharmacology
Pothinam, Sompon, Assistant in Obstetrics and Gynecology
Powell, Gary L., USPHS Postdoctoral Fellow in Biological Chemistry
Price, Thomas H., Assistant in Medicine
Proskey, Vincent J., Missouri and St. Louis Heart Associations Fellow in Medicine (Cardiology)
Pugh, Daniel D., Assistant and Trainee (NIMH) in Psychiatry
Pulliam, Morris W., Assistant in Surgery (on leave of absence)
Pundavela, Lilia, Assistant in Pediatrics

Qubain, Hany I., Assistant in Pediatrics
Quick, Colleen M., Research Assistant in Psychiatry

Rabhan, Walter N., Fellow and Trainee (NIAMD) and Assistant in Orthopedic Surgery
Ragab, Abdel Salam, Clinical Fellow in Pediatrics (Hematology)
Ragsdale, Edward F., Assistant in Radiology
Rainey, Robert, Assistant in Clinical Surgery
Ramsey, Constance, Assistant in Ophthalmology
Rao, Aswatha N., Fellow in Orthopedic Surgery
Reams, Harold L., Assistant in Otolaryngology
Reese, Lester T., Assistant in Medicine (Dermatology)
Reich, Theodore, Assistant in Psychiatry
Reisler, David Martin, Assistant and Fellow (NINDB) in Neurology
Rendleman, David D., Trainee (NIAMD) in Preventive Medicine
Rhee, Young Wung, Assistant in Psychiatry
ASSISTANTS, FELLOWS, AND TRAINEES

Riggs, Thomas E., Assistant in Medicine
Riley, Michael V., Research Fellow in Ophthalmology
Riley, Solomon L., Jr., Assistant in Pathology and Trainee (NIGMS) in Experimental Pathology
Ritzinger, Frances C., Assistant in Medical Psychology and Trainee (NIMH) in Clinical Psychology in Child Psychiatry
Robertson, Charles L., Assistant in Radiology
Roggensack, George F., Assistant in Radiology
Roncari, Daniel A. K., Medical Research Council of Canada Fellow in Biological Chemistry
RONTAL, Michael, Assistant in Otolaryngology
Rosenfeld, Michael G., Assistant in Medicine
Ross, Charles David, NDEA Title IV Predoctoral Fellow in Pharmacology
Rossman, Kent J., Assistant in Medicine
Rovainen, Carl M., USPHS Postdoctoral Fellow in Pharmacology
Rumelt, Michael Barry, Assistant in Medicine
Rutherford, Charles L., Postdoctoral Fellow in Pharmacology

Saghir, Marcel, Assistant in Psychiatry
Saha, Jagnesswar, Missouri and St. Louis Heart Associations Fellow in Medicine (Cardiology)
Sakurai, Chester Y., Jr., Assistant in Surgery (on leave of absence)
Sakurai, Tadashi, Research Assistant in Medicine
Samayoa, Eduardo, Assistant in Medicine
Sanchez, Abelardo B., Assistant and Fellow (NINDB) in Neurology
Santos, Rustico, Assistant in Medicine
Sarma, K. T., Assistant in Surgery (Anesthesiology)
Sasser, William F., Jr., Fellow and USPHS Senior Clinical Trainee in Thoracic Cardiovascular Surgery
Sauer, John C., Trainee (NIGMS) in Experimental Pathology
Schaberg, Kevin B., Assistant in Obstetrics and Gynecology
Schangold, Ellen F., Research Assistant in Sociology in Psychiatry
Schechter, Gary L., Assistant in Otolaryngology
Schmidt, Robert William, Assistant in Medicine
Schneider, Arthur B., Assistant in Medicine
Schneiderman, Steven M., Assistant in Medicine
Schuham, Anthony Irving, Research Assistant in Medical Psychology in Child Psychiatry
Schulenburg, Elizabeth, Trainee (NIAID) in Microbiology
Schulz, Demoy W., Research Assistant in Pharmacology
Schuur, Mary Anne, Assistant in Pediatrics
Scott, Audrey A., Research Assistant in Pharmacology
Sedgewick, Karen, NSF Predoctoral Fellow in Biological Chemistry
Segelbaum, Robert S., Research Assistant in Computer Science in Psychiatry
Sena-Esteves, Fernando, NATO Postdoctoral Fellow in Pharmacology
Serrano, Hugo S., Assistant in Orthopedic Surgery
Sessions, Donald Gordon, Assistant and Fellow (NINDB) in Otolaryngology
Sessions, Roy B., Assistant and Fellow (NINDB) in Otolaryngology
Shafer, James William, Assistant in Ophthalmology
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Shaw, Allen Bernard, Medical Research Council Fellow in Medicine (Renal Diseases)
Shaw, Richard B., Assistant in Surgery
Shaw, Richard C., Assistant in Surgery

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Shih, Hsin-Chin, Assistant in Pediatrics
Shumaker, Jay B., Assistant in Medicine
Shuter, Eli R., USPHS Special Research Fellow in Biochemistry in Psychiatry
Sigler, John K., Jr., Assistant in Surgery
Silber, Igal, Fellow in Genitourinary Surgery
Silberman, Lynn E., Assistant in Radiology
Silbert, David F., American Cancer Society Postdoctoral Fellow in Biological Chemistry
Silbert, Shirley Wang, Assistant in Pathology and Trainee (NIGMS) in Experimental Pathology
Singh, Dadadhai K., Fellow in Medicine (Cardiology)
Skelton, Margaret, Research Assistant in Radiology
Skelton, Marvin E., Assistant in Radiology
Sleator, Esther, Assistant in Pediatrics
Small, Richard B., Assistant in Surgery
Smith, Barbara Ruth, Research Assistant in Biological Chemistry
Smith, Howard J., Assistant in Medicine
Smith, James L., III, Research Assistant in Radiology
Smith, Jeanne Marie, Research Assistant in Neurology
Smith, Robert Marchand, Trainee (NHI) in Medicine (Cardiology)
Sokol, Robert J., Assistant in Obstetrics and Gynecology
Spector, Michael, Assistant in Medicine
Spencer, Sylvia Jane, Research Assistant in Psychiatry
Spinola, Rodrigo, Research Fellow in Otolaryngology
Srivastava, Laxmi S., Research Assistant in Medicine
Standefer, James Earl, Assistant in Ophthalmology and Fellow (NINDB) in Ophthalmology
Stein, Mervyn R., Assistant in Ophthalmology
Steinberg, Lawrence S., Assistant in Pathology
Steiner, Alton L., Trainee (NIAMD) in Medicine (Metabolism)
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Stiles, William R., Assistant in Surgery
Stoler, Barry S., Assistant in Medicine
Stone, Susan Carol, Research Assistant in Psychiatry
Studer, Rebecca K., Research Assistant in Radiology
Sturmfels, Gloria, Research Fellow and Research Trainee (NIMH) in Medical Psychology
Sugita, Minoru, Merck, Sharpe and Dohme International Fellow in Clinical Pharmacology in Medicine (Renal Diseases)
Sullivan, John, Assistant in Medicine
Sungo, Roberto N., Fellow in Ophthalmology
Sypert, George W., Assistant in Surgery

Takahashi, Yasuro, Research Fellow in Medicine (Metabolism)
Takasaka, Tomonori, Research Fellow in Otolaryngology
Takenouchi, Satoru, Research Fellow in Otolaryngology
Talbot, Claire J., Research Assistant in Social Work in Psychiatry
Tateishi, Shoji Joseph, Assistant in Pediatrics
Taute, Herman, Assistant in Clinical Obstetrics and Gynecology
Teitelbaum, Steven L., American Cancer Society Clinical Fellow in Pathology (Surgical Pathology)
Tenenbaum, Stanley, Assistant in Pediatrics
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Thomas, Charlotte A., Research Assistant in Pharmacology
Thompson, M. Bryant, Assistant in Obstetrics and Gynecology
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Tillman, Roosevelt, Research Assistant in Pathology
Torres, Carlos, Assistant in Pediatrics
Tosi, Terry Owens, Assistant in Pediatrics
Turner, James W., Jr., Assistant in Medicine

Udonponsanontha, N., Assistant in Psychiatry
Ulrich, Richard F., Assistant in Medicine (on leave of absence)
Unno, Tokuji, Research Fellow in Otolaryngology

Van Gilder, John C, Assistant in Neurological Surgery
Van Patten, Elizabeth S., Research Assistant in the Biomedical Computer Laboratory
Vargas, Teodoro, Assistant in Surgery (Anesthesiology)
Vasquez, Lino, Assistant in Obstetrics and Gynecology
Velton, David, Research Assistant in the Biomedical Computer Laboratory
Vermuylen, Jozef, Lederle International Fellow and Belgian National Foundation Fellow in Medicine (Enzymology)
Villaca, Lucio F., Assistant and Trainee (NIMH) in Psychiatry
Voss, Edward W., Jr., USPHS Research Fellow in Microbiology

Wagner, William H., Jr., Assistant in Obstetrics and Gynecology
Wagoner, Norma E., Trainee (NIGMS) in Anatomy
Walbran, Bonnie B., Research Assistant in the Biomedical Computer Laboratory
Walchner, Andreas M., Assistant in Pediatrics
Walker, Andrew W., Assistant in Plastic Surgery
Walsh, Rosemarie, Research Assistant in Biochemistry in Psychiatry
Waltman, Stephen Reeves, Assistant and Fellow (NINDB) in Ophthalmology
Walz, Bruce James, Trainee in Radiation Therapy (on leave of absence)
Wang, Tso-Ming, Special Fellow Trainee in Microbiology
Wamsley, James R., Assistant in Surgery
Ward, John Barrie, NATO Research Fellow in Biological Chemistry
Waxman, Herbert S., Trainee (NIAMD) in Medicine (Hematology)
Wedner, H. James, Assistant in Medicine
Web, George C., Assistant in Surgery
Wei, Irene Yi-Lien, Research Assistant in Biochemistry in Psychiatry
Weinstein, Robert H., Assistant in Medicine
Weis, Landy Suzanne, Assistant in Pathology and Trainee (NIGMS) in Experimental Pathology
Weisser, Fred, Assistant in Medicine
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Wiksell, Audre, USPHS Intermediate Predoctoral Fellow in Biological Chemistry
Wilbois, Ronald P., Assistant in Obstetrics and Gynecology
Williams, Charles H., Assistant in Radiology
Wilson, Gary R., Research Fellow and Research Trainee (NIMH) in Medical Psychology
Wirthlin, Alvin J., Assistant in Medicine
Wise, Leslie, Research Fellow in Surgery
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Wood, Fred Marshall, Assistant in Orthopedic Surgery
Wood, William Gerald, Assistant in Pathology and Trainee (NIGMS) in Experimental Pathology
Woodbury, John D., Trainee (NIAMD) in Medicine (Gastroenterology)
Woodruff, Sharon Lynn, Assistant and Fellow (NINDB) in Neurology
Yin, Ee Thye, Research Assistant in Medicine
Yoerg, Robert L., Assistant in Medicine
Yonkers, Anthony James, Assistant and Fellow (NINDB) in Otolaryngology
Yurdakul, Ayse Belma, Assistant in Pediatrics

Zappia, Robert J., Fellow in Ophthalmology
Zimmerman, Herbert B., Assistant in Medicine
Zinbo, Mikio, Research Assistant in Biochemistry in Psychiatry
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MEDICAL SCIENTIST TRAINING PROGRAM

This program gives the opportunity to gain basic scientific training in depth to a selected number of students during their time in medical school. The program takes advantage of the new curriculum of the Washington University School of Medicine and the many graduate courses which have been initiated over the past several years. Usually six years of study are required to earn both an M.D. and a Ph.D. degree. The major purpose of this program is to provide the background and training required to produce medical scientists skilled in the study of modern biology for clinical and preclinical facilities of medicine.

The program consists of three segments: (1) two years of the normal new medical curriculum modified as listed below, (2) three or more years of thesis work to satisfy requirements for the Ph.D. degree, and (3) a final year which is the normal third year of the medical curriculum. Since the normal fourth medical school year is completely elective, the medical scientist will have taken the equivalent of this year during his thesis work, and thereby he will have completed the total requirements for the M.D. degree.

While the M.S.T.P. program includes all those medical courses required for the M.D. degree, it incorporates (1) a high degree of flexibility for individual students through careful selection of electives and (2) Ph.D. work in one of a large number of thesis programs available at Washington University. By the end of the second year students will elect the area for their basic medical training. Thesis programs are available in the Departments of Anatomy, Biological Chemistry, Microbiology, Pathology, Pharmacology, and Physiology and Biophysics. In addition, thesis work can be done in Molecular Biology or Neurobiology. The latter two disciplines are administered by interdepartmental committees, and the faculty includes members of the departments and faculty from the Departments of Biology, Chemistry, Physics, Electrical Engineering, Neurology, Ophthalmology, Otolaryngology, and Psychiatry.

ELIGIBILITY

Applicants must meet requirements for admission to both the Medical School and the Graduate School of Arts and Sciences. The program is designed for students who have completed their undergraduate education with a major emphasis on science. In addition to the minimum requirements established for acceptance into the Medical School and the Graduate School, students with a greater concentration in the chemical or physical areas should have completed mathematics through calculus, physics and physical chemistry (with calculus as a prerequisite), and advanced organic chemistry. A course in differential equations is also recommended. For students whose major interests are in the biological areas, the requirements for chemistry are less rigorous, but a strong background in mathematics and physics is essential. Although most of the students will enter the program as first-year students, applications will be accepted from students in residence.
THE TRAINING PROGRAM

The students begin their training July 1 of the year they enter the School of Medicine. The first summer and the summer after the first year are free for formal course work in any educational institution in order to strengthen scientific background or for research work in the laboratories of the University. Since many of the students will have completed the requirements, they will have an opportunity to begin supervised research immediately, and this can be continued in free periods during the first two years.

The first two years are basically the Medical School courses of the new curriculum. However, a student capable of passing an examination in any of the preclinical courses will be allowed to substitute in the time made available either advanced course work or laboratory research. The courses differ from the usual medical courses with respect to the laboratory training periods and the availability of additional elective courses. Whereas students enrolled in the M.S.T.P. program will have begun laboratory work during the summer and will have additional intensive laboratory training, they may elect, with approval, to omit the laboratory component of a course, to take selected parts of a laboratory, or to take the entire laboratory component. This will be decided for each student by the Medical Scientist Training Program Student Advisory Committee. The time which is not utilized in the normal laboratory components will be occupied by work in research laboratories and by elective tutorial courses. A student may elect to work either in the same laboratory repeatedly or in a number of different laboratories during the first two years. Elective tutorial courses are offered to supplement in depth the normal course material. These courses include advanced biochemistry, microbial genetics, immunology, neurobiology, biophysics, cell biology and cytology, advanced pharmacology, and pathobiology. In addition, the formal graduate courses are available to the more advanced students.

Year 1

First Semester: Anatomy, Biochemistry, Topics in Clinical Medicine.

Second Semester: Physiology, Microbiology, Neuroanatomy, Genetics, Biostatistics.

Year 2

First Semester: Pathology, Pathophysiology, Physical Diagnosis, History of Medicine.

Second Semester: Pathophysiology, Radiology, Neurology, Surgery, Pediatrics, Ophthalmology, Otolaryngology, Pharmacology, Preventive Medicine, Psychiatry, Obstetrics and Gynecology, Laboratory Diagnosis, Clinical Diagnosis.

The similarity in the course content between the Medical Scientist Training Program and the curriculum in the first two years of the M.D. degree program per se make it possible for a student to return to the regular curriculum after the first two years without loss of time if he desires so to do or by the direction of the Medical Scientist Student Advisory Committee.
Years 3, 4, 5

Graduate School Requirements. During the second semester of the second year the student selects a faculty adviser with whom he will do his thesis research and a department or committee with which he will work toward a Ph.D. degree. The decision is made by the student and the chairman of the department or committee after discussion with the Medical Scientist Training Program Student Advisory Committee. As prerequisites vary for the different departments and committees, the student should make appropriate inquiries and arrangements well in advance. The student will spend the third, fourth, and fifth, and possibly the sixth years to satisfy requirements for the Ph.D. degree. The formal requirements for that degree include (1) completion of course work; (2) successful performance in a qualifying examination, usually at the end of the third year, in the department or committee to which he is applying; (3) successful performance in one foreign language examination; (4) original research suitable for a dissertation; and (5) defense of the thesis. A detailed description of graduate courses and the requirements of the individual departments may be obtained by writing to the Director of Graduate Studies in the specific department or committee.

Seminars in Research Medicine. A program of special monthly seminars will be arranged for students during the research years. Conducted by medical scientists of the clinical departments of the Washington University School of Medicine, these seminars are aimed at stimulating student interest in clinical medicine and increasing awareness of major research problems in clinical medicine.

Final Year in Clinical Medicine

The sixth year is the third year of the normal medical curriculum. The intensive clinical training provided in this year is the last formal requirement for an M.D. degree. The Ph.D. and the M.D. degrees will be granted simultaneously at the end of the final clinical year.

FINANCIAL SUPPORT

Students selected for this program in September, 1968, will be offered full tuition for the duration of their training.

STUDENT COUNSELORS

Each medical scientist student will be assigned a counselor (a member of the Medical Scientist Student Advisory Committee) who will meet with him frequently during the first two years to help him decide in which elective courses and laboratories he will participate. After the second year, the student will be supervised by the graduate department or committee which he chooses.

APPLICATION FOR ADMISSION

Individuals interested in entering the Medical Scientist Training Program are instructed to write the Office of the Registrar, School of Medicine, specifically requesting application forms for the Medical Scientist Training Program.
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WASHINGTON UNIVERSITY
SCHOOLS AND DIVISIONS

All schools except Medicine, Dentistry, and Nursing are located on the main campus at Lindell and Skinker Boulevards, St. Louis, Missouri 63130.

THE FACULTY OF ARTS AND SCIENCES
  THE COLLEGE OF ARTS AND SCIENCES
  THE GRADUATE SCHOOL OF ARTS AND SCIENCES

THE SCHOOL OF ENGINEERING AND APPLIED SCIENCE

THE SEVER INSTITUTE OF TECHNOLOGY

THE SCHOOL OF ARCHITECTURE

THE SCHOOL OF BUSINESS AND PUBLIC ADMINISTRATION

THE GRADUATE SCHOOL OF BUSINESS ADMINISTRATION

THE SCHOOL OF FINE ARTS

THE SCHOOL OF SOCIAL WORK

THE SCHOOL OF LAW

THE SCHOOL OF MEDICINE

THE SCHOOL OF DENTISTRY

THE SCHOOL OF NURSING

UNIVERSITY COLLEGE

THE SUMMER SCHOOL
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<td>Associate Dean</td>
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<td>Book Store</td>
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<td>News Bureau</td>
<td>1st Wohl Hospital</td>
</tr>
<tr>
<td>Payroll</td>
<td>1st Cancer Research Building</td>
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<tr>
<td>Registrar</td>
<td>1st Cancer Research Building</td>
</tr>
<tr>
<td>Vice Chancellor</td>
<td>1st North Building</td>
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### Teaching and Research Divisions and Auxiliary Medical Services

<table>
<thead>
<tr>
<th>Division</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>Anesthesia (For Nurses)</td>
<td>3rd and 4th Barnes</td>
</tr>
<tr>
<td>Child Psychiatry, Division of</td>
<td>369 North Taylor</td>
</tr>
<tr>
<td>Gerontology, Division of</td>
<td>5600 Arsenal Street</td>
</tr>
<tr>
<td>Hospital Administration</td>
<td>724 South Euclid</td>
</tr>
<tr>
<td>Neurology, Institute of</td>
<td>8th Oscar Johnson Institute</td>
</tr>
<tr>
<td>Occupational Therapy</td>
<td>4567 Scott</td>
</tr>
<tr>
<td>Physical Therapy</td>
<td>7th McKinley Building</td>
</tr>
<tr>
<td>Tumor Services, Division of</td>
<td>9th Wohl Hospital</td>
</tr>
<tr>
<td>X-ray Technology</td>
<td>Mallinckrodt</td>
</tr>
<tr>
<td>Electron Microscope</td>
<td>7th Mallinckrodt, Basement West Bldg.</td>
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### Departments

<table>
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<tr>
<th>Department</th>
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<tbody>
<tr>
<td>Anatomy</td>
<td>3rd and 4th North Building</td>
</tr>
<tr>
<td>Cytology</td>
<td>2nd Barnard</td>
</tr>
<tr>
<td>Electron Microscopy</td>
<td>9th Wohl Clinic</td>
</tr>
<tr>
<td>Histology</td>
<td>3rd North Building</td>
</tr>
<tr>
<td>Neuroanatomy</td>
<td>3rd North Building</td>
</tr>
<tr>
<td>Biological Chemistry</td>
<td>2nd South Building</td>
</tr>
<tr>
<td>Biomedical Computer Laboratory</td>
<td>South Building</td>
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<tr>
<td>Internal Medicine</td>
<td>6th Wohl Hospital</td>
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<tr>
<td>Cardiovascular Division</td>
<td>8th Wohl Hospital</td>
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<tr>
<td>Dermatology</td>
<td>8th Wohl Clinic</td>
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<tr>
<td>Enzymology</td>
<td>6th Wohl Hospital</td>
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DEPARTMENTS

Gastroenterology
Genetics
Hematology
Hypertension
Immunology
Infectious Diseases
Metabolism
Psychosomatic Medicine
Pulmonary Disease
Renal Division
Virology
Microbiology
Neurology
Obstetrics and Gynecology
Ophthalmology
Otolaryngology
Pathology
  Cancer Research
  Parasitology
  Surgical Pathology
  Serology Laboratory
Pediatrics
Pharmacology
Physiology and Biophysics
  Neurophysiology
Preventive Medicine and Public Health
  Biostatistics
Psychiatry
Radiology
  Diagnostic
  Nuclear Medicine
  Radiation Biology
  Radiation Physics
  Ultrasound Laboratory
Rehabilitation
Surgery
  Anesthesiology
  Neurosurgery
  Orthopedics
  Urology

LOCATION (BY FLOOR AND BUILDING)

7th Wohl Clinic
6th Wohl Clinic
7th Wohl Hospital
4102 Queeny Tower
8th Wohl Clinic
6th Wohl Hospital
8th Wohl Clinic
1st Renard
7th Wohl Clinic
7th Wohl Clinic
6th Wohl Hospital
7th West Building
8th Oscar Johnson Institute
3rd Maternity
12th Oscar Johnson Institute
9th Oscar Johnson Institute
3rd West Building
4th Cancer Research Building
3rd Service Building
3rd Service Building
3rd Service Building
500 South Kingshighway
3rd South Building
4th South Building
8th Oscar Johnson Institute
2nd West Building
724 South Euclid
2nd Renard
Mallinckrodt
1st Mallinckrodt
6th Barnard
6th Mallinckrodt
6th Mallinckrodt
Mallinckrodt
Irene Johnson Institute
9th Wohl Hospital
3rd Barnes
3rd Wohl Clinic
9th Wohl Hospital
2nd Wohl Hospital
<table>
<thead>
<tr>
<th>CONTACT</th>
<th>FOR INFORMATION CONCERNING</th>
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</thead>
<tbody>
<tr>
<td>Office of the Dean</td>
<td>Administration</td>
</tr>
<tr>
<td>Office of the Vice Chancellor for Medical Affairs</td>
<td>Gifts and Bequests</td>
</tr>
<tr>
<td>Office of the Associate Dean</td>
<td>Student Affairs</td>
</tr>
<tr>
<td>Office of the Registrar</td>
<td>Admissions Procedure</td>
</tr>
<tr>
<td></td>
<td>Application Forms</td>
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<td>Student Financial Aid</td>
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<td>Evaluations</td>
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<td>Transcripts</td>
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<td>Student Accounts</td>
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<td>Calendar of Events</td>
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<td>Records</td>
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<td>Courses</td>
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<td>Exchange Visitor Program</td>
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<tr>
<td>Office of the Director, Olin Dormitory</td>
<td>Room Reservations</td>
</tr>
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<td>Dormitory Housing</td>
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<tr>
<td>Office of the Director, News Bureau</td>
<td>Bulletins and Publications</td>
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<tr>
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<td>Programs</td>
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<td>Historical Material</td>
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<td>Scheduled Functions</td>
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<tr>
<td>Office of the Alumni Secretary</td>
<td>Alumni Affairs</td>
</tr>
<tr>
<td>Personnel Office</td>
<td>Part-time Employment</td>
</tr>
<tr>
<td>Office of the Director, Graduate Program in Hospital Administration</td>
<td>Graduate Program in Hospital Administration</td>
</tr>
<tr>
<td>Office of the Director, Occupational Therapy</td>
<td>Occupational Therapy</td>
</tr>
<tr>
<td>Office of the Director, Physical Therapy</td>
<td>Physical Therapy</td>
</tr>
<tr>
<td>Office of the Dean, School of Dentistry</td>
<td>School of Dentistry</td>
</tr>
<tr>
<td>Office of the Dean, School of Nursing</td>
<td>School of Nursing</td>
</tr>
</tbody>
</table>
Address all inquiries to
Washington University School of Medicine
660 South Euclid Avenue
St. Louis, Missouri 63110
Telephone: (314) 367-6400
This Bulletin is a statement of the work of the School of Medicine and contains announcements and available information of courses and regulations for the academic year 1968-69. It will, therefore, constitute the current catalogue of the School of Medicine until the next edition in July, 1969.