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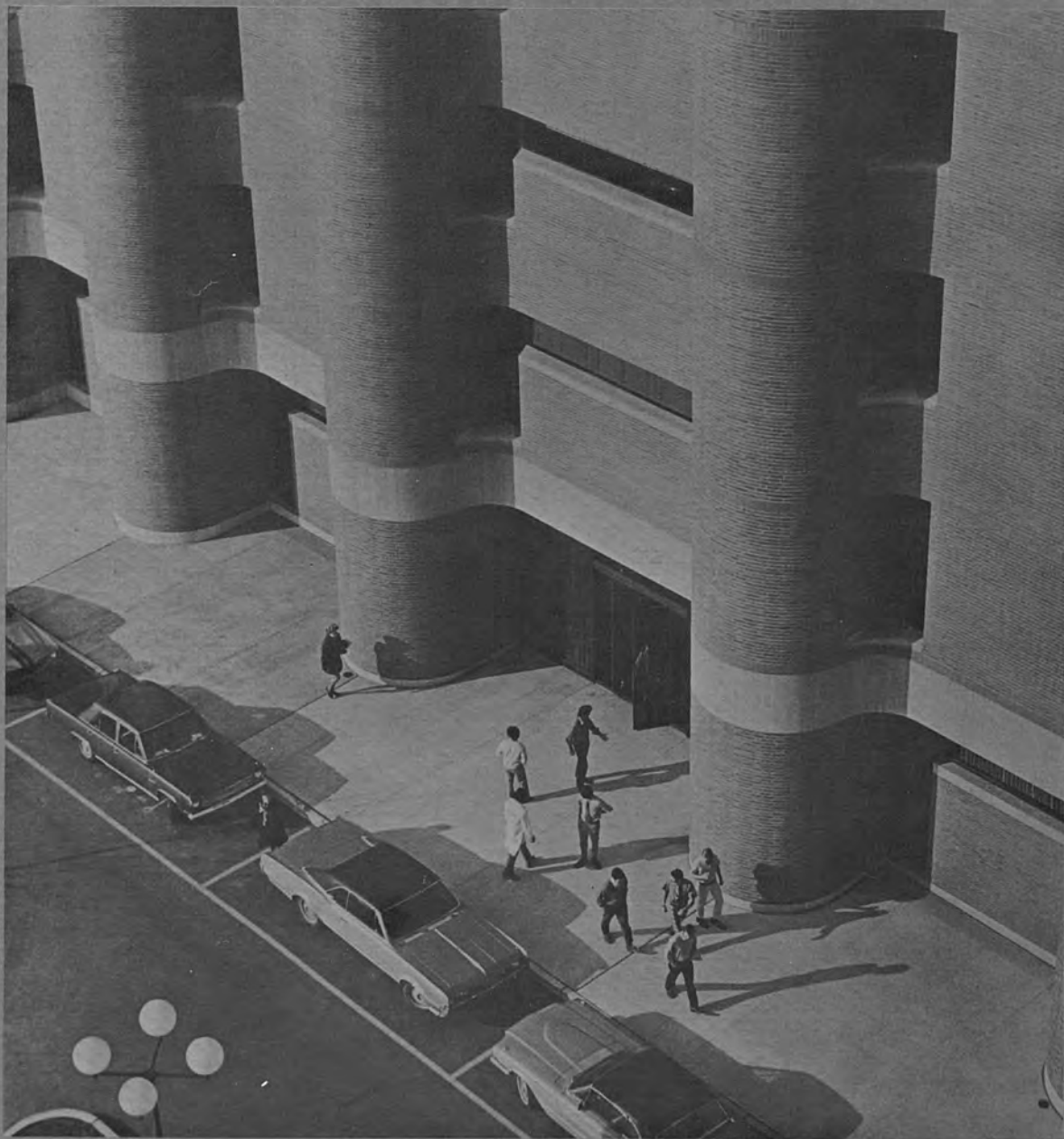
Pat Roman



Bulletin of
Washington University
St. Louis, Missouri

71|72

School of Medicine



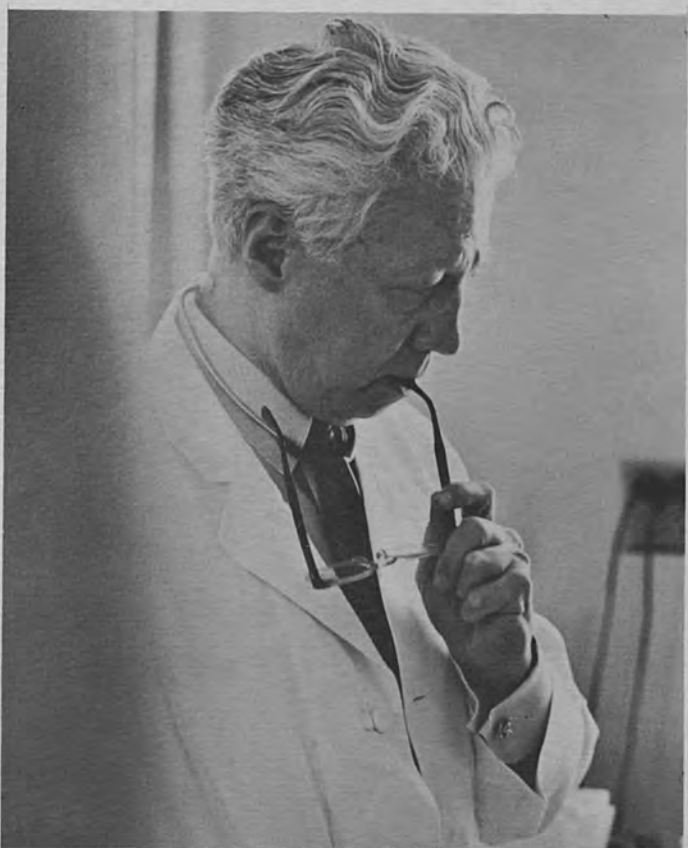
Pat Roman

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What is spoken of as a "clinical picture" is not just a photograph of a man sick in bed; it is an impressionistic painting of the patient surrounded by his home, his work, his relations, his friends, his joys, sorrows, hopes, and fears.

Francis Weld Peabody





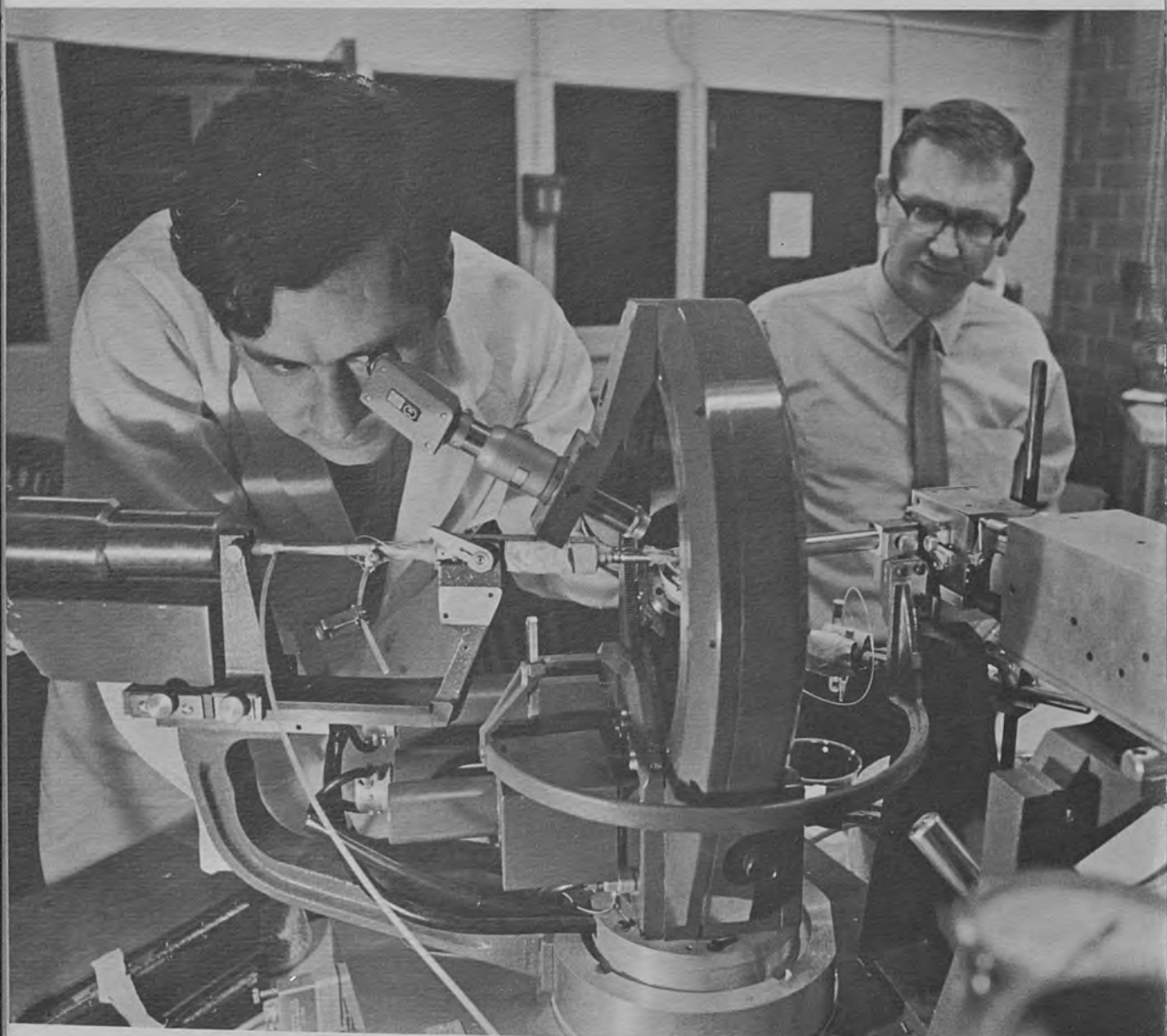
The whole point of a university, on its educational side, is to bring the young under the intellectual influence of a band of imaginative scholars.

Alfred North Whitehead



But solving problems of disease is not the same thing as creating health and happiness. This task demands a kind of wisdom and vision which transcends specialized knowledge of remedies and treatments and which apprehends in all their complexities and subtleties the relation between living things and their total environment. Health and happiness are the expression of the manner in which the individual responds and adapts to the challenges that he meets in everyday life.

Rene Dubos

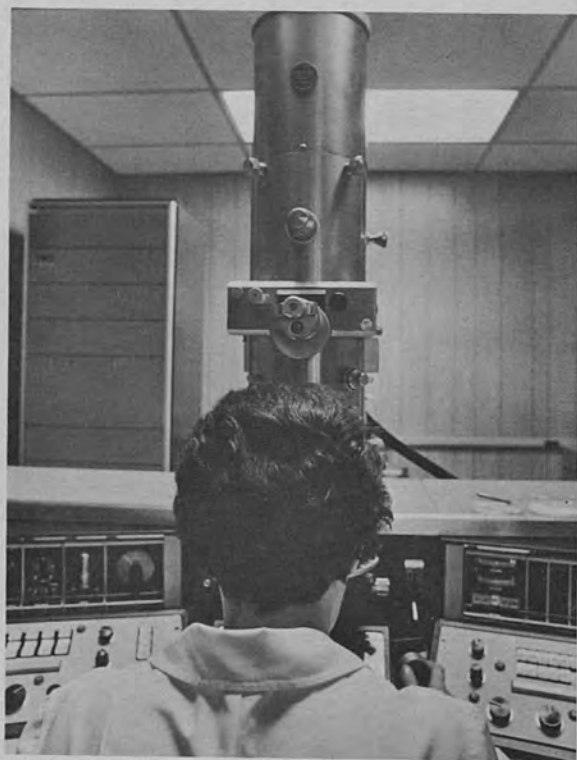
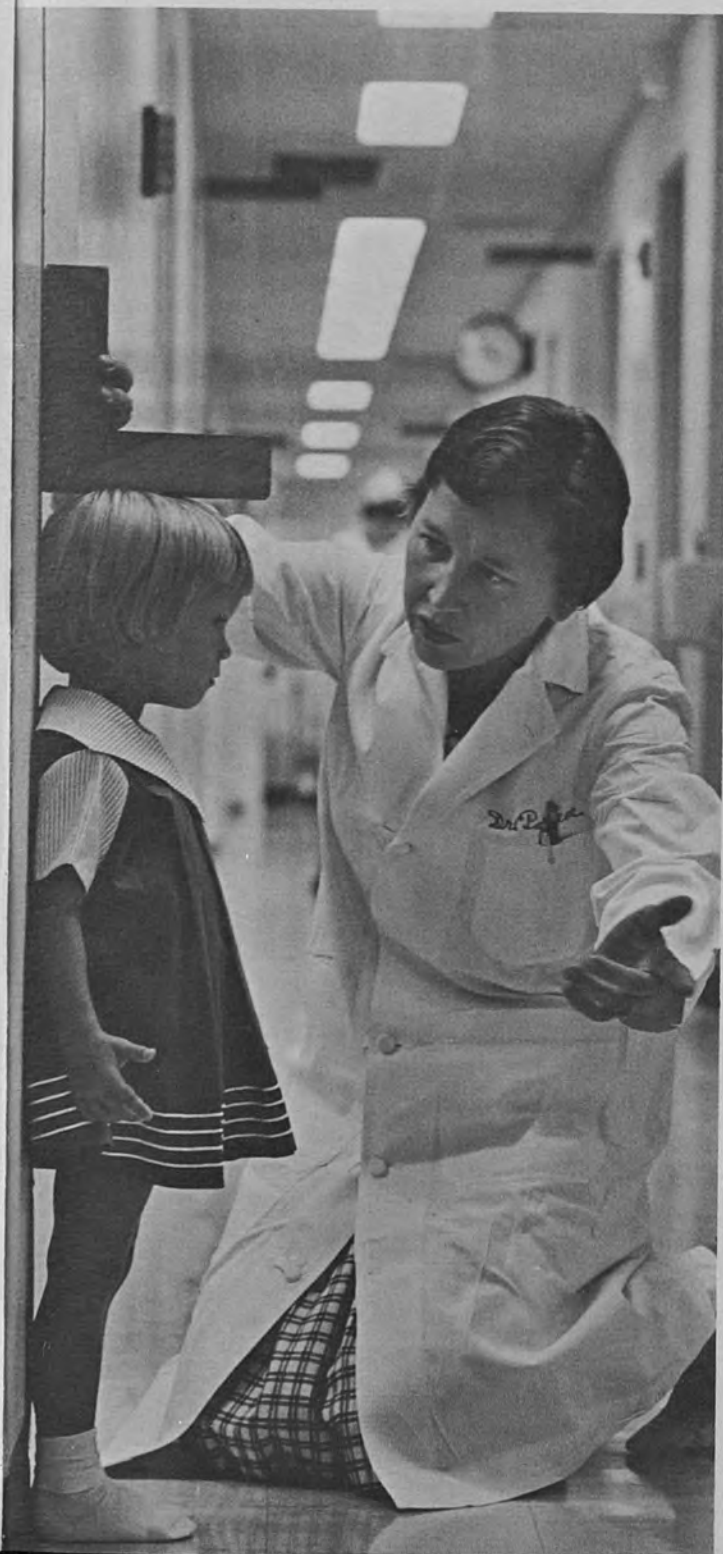


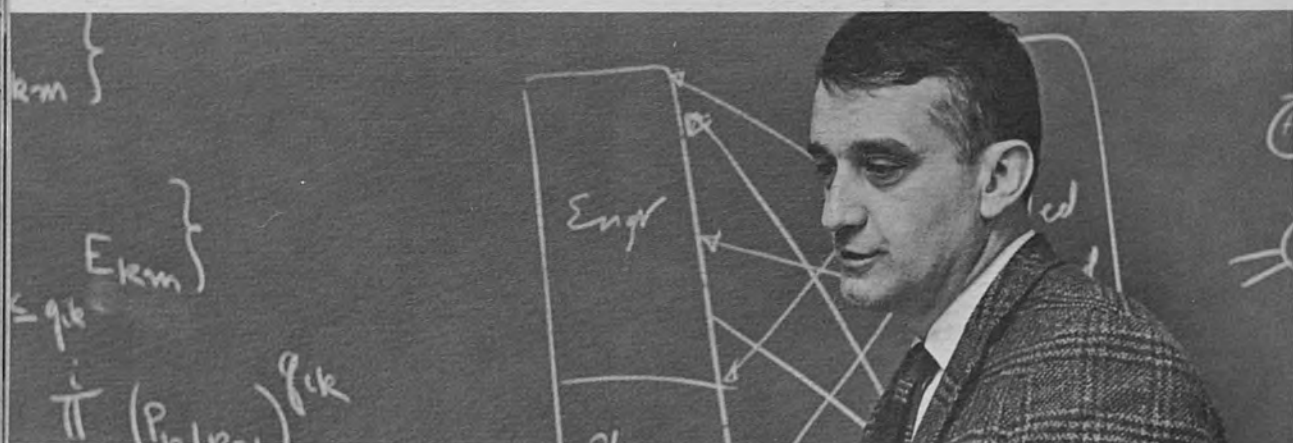


Come, let us work and in this little time
do some new thing that no one on this
earth has ever thought to do. Split from
the world's eternal truth some atom of the
everlasting! Then let us die, and leave for
coming generations one bit of knowledge
by which we'll be remembered until some
later one shall show the truth we found
was but a grain gleaned from some vast
store we'd hardly touched and we shall be
forgot and he remembered—but we, out
where the absolute is near, shall smile
seeing how little a beach of sand resembles
the granite cliff from which it weathered.

Sam L. Clark, Sr.

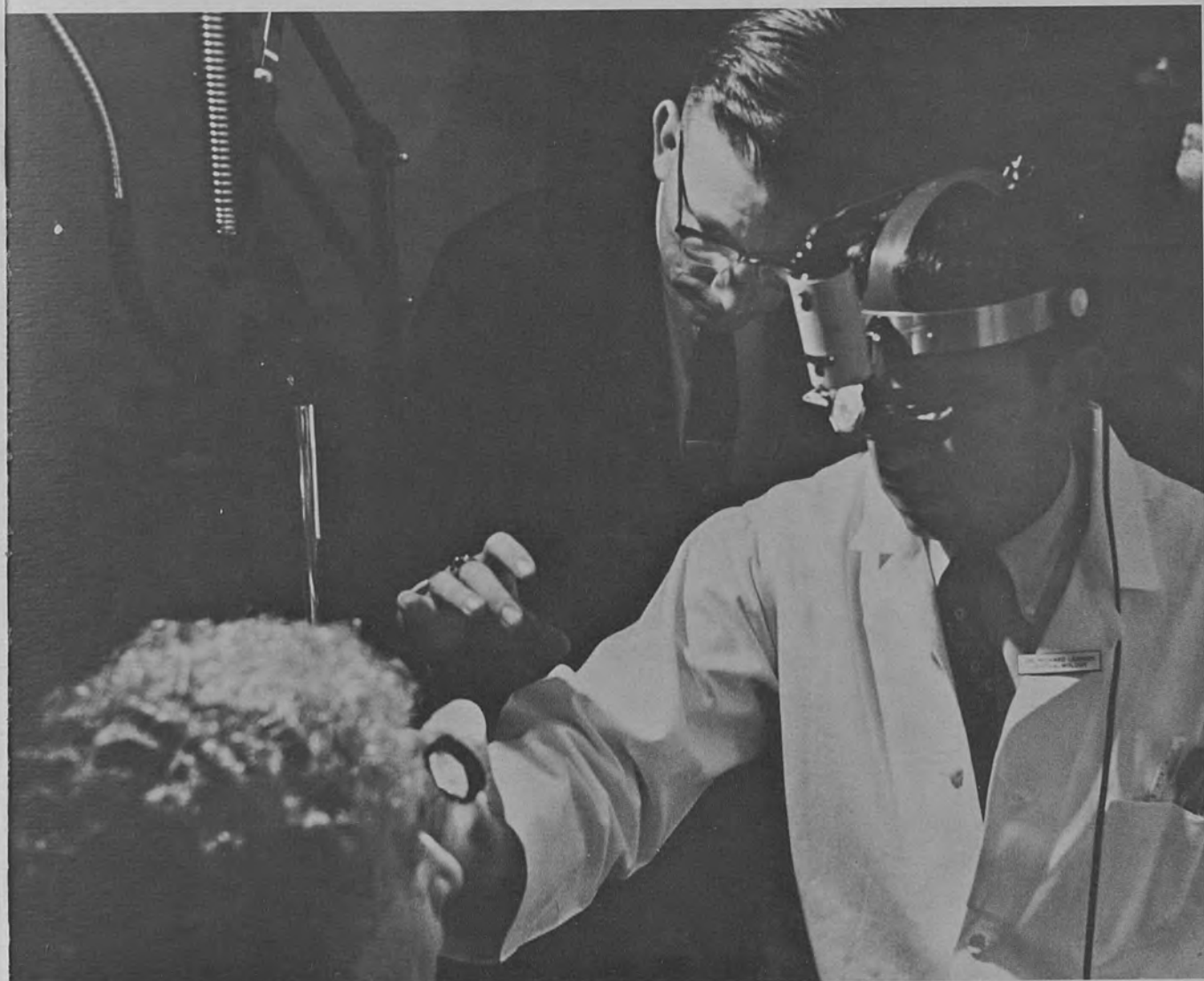






Both the man of science and the man of art live always at the edge of mystery, surrounded by it; both always, as the measure of their creation, have had to do with the harmonization of what is new with what is familiar, with the balance between novelty and synthesis, with the struggle to make partial order in total chaos.

J. Robert Oppenheimer

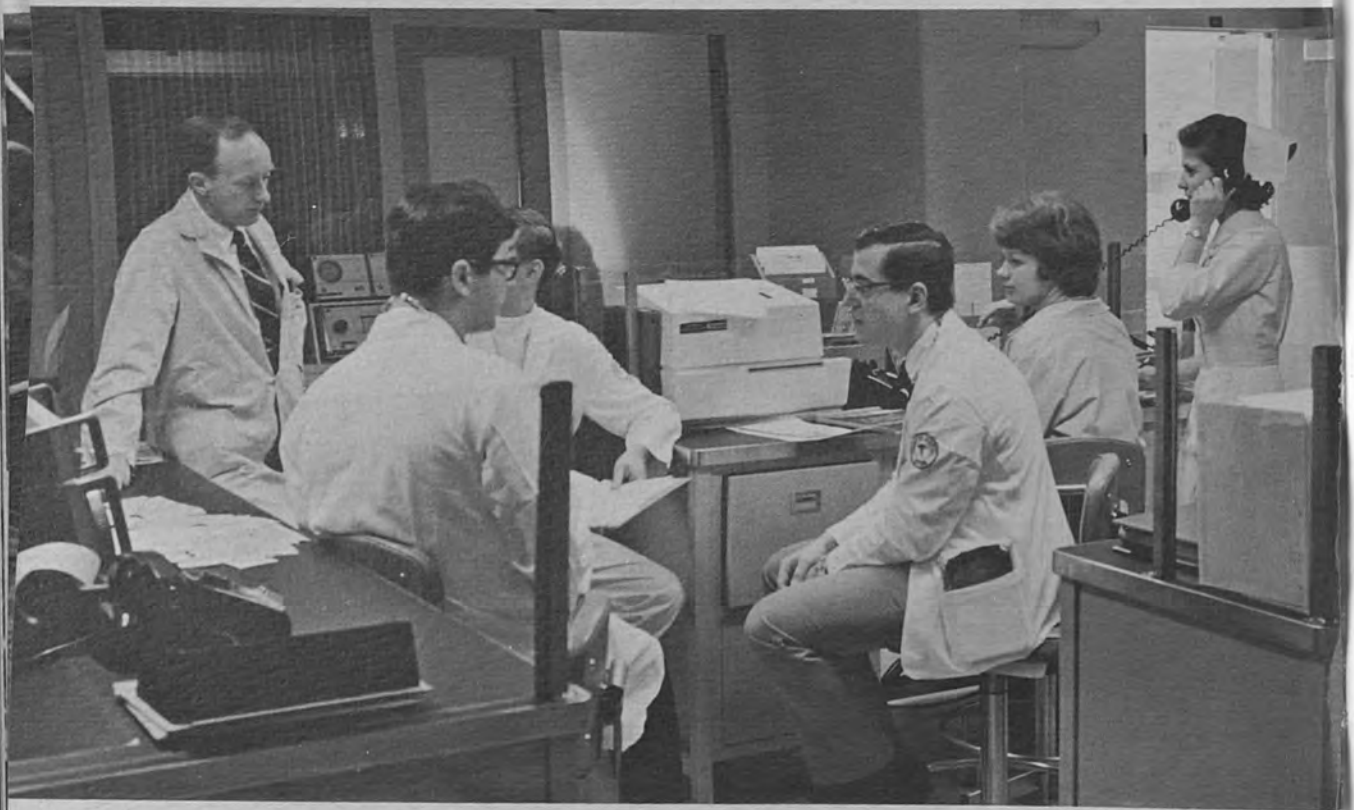
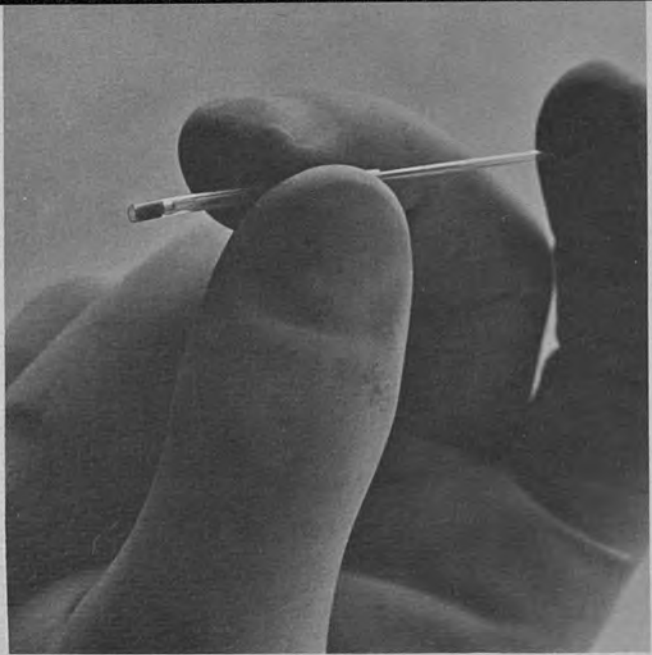


It is a rare blending of learning and humanity, incisiveness of intellect and sensitiveness of the spirit, which occasionally come together in an individual who chooses the calling of Medicine; and then we have the great physician.

Hans Zinsser







Bulletin of
Washington University
St. Louis, Missouri

School of Medicine

June 15, 1971



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Calendar

1971-72
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September

- 1 **Wednesday.** Orientation and registration for all new students.
1, 2 **Wednesday, Thursday.** Examination for advanced standing and removal of conditions.
3 **Friday.** Registration for upper-class students.
6 **Monday.** Labor Day, holiday.
7 **Tuesday.** Classes begin.

November

- 25 **Thursday.** Thanksgiving Day, holiday.
29 **Monday.** Winter quarter begins.

December

- 18 **Saturday.** Christmas recess begins at 1:00 p.m.

1972

January

- 3 **Monday.** Christmas recess ends at 8:00 a.m.
17 **Monday.** Registration for the second semester.
24 **Monday.** Second semester begins.

March

- 6 **Monday.** Spring quarter begins.
29 **Wednesday.** Senior Research Program.
31 **Friday.** Easter holiday.

April

- 1 **Saturday.** Easter holiday.

May

- 27 **Saturday.** Academic year ends.
28 **Sunday.** Commencement.

June

- 12 **Monday.** Summer session of clinical year begins.

September

- 2 **Saturday.** Summer session of clinical year ends.

(1st 2 yr med only)

1st 2 yr med

Thurs. & Sat

Fri. May 26

1972-73
1972

August		
30	Wednesday.	Orientation and registration for all new students.
30, 31	Wednesday, Thursday.	Examination for advanced standing and removal of conditions.

September		
1	Friday.	Registration for upper-class students.
4	Monday.	Labor Day, holiday.
5	Tuesday.	Classes begin.

November		
23	Thursday.	Thanksgiving Day, holiday.
27	Monday.	Winter quarter begins.

December		
16	Saturday.	Christmas recess begins at 1:00 p.m.

1973

January		
2	Tuesday.	Christmas recess ends at 8:00 a.m.
15	Monday.	Registration for second half-year.
22	Monday.	Second semester begins.

March		
5	Monday.	Spring quarter begins.
28	Wednesday.	Senior Research Program.

April		
20, 21	Friday, Saturday.	Easter holiday.

May		
26	Saturday.	Academic year ends.
28	Monday.	Memorial Day, holiday. Senior Awards night.
29	Tuesday.	Commencement.

June		
11	Monday.	Summer session of clinical year begins.

September		
1	Saturday.	Summer session of clinical year ends.

Administration

WASHINGTON UNIVERSITY

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Bridge Chancellor

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Executive Vice Chancellor

Lattie F. Coor, Ph.D.

Vice Chancellor

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Vice Chancellor for Research

Officers of the School of Medicine

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John C. Herweg, B.S., M.D.

Associate Dean for Students

Richard W. Hudgens, A.B., M.D.

Associate Dean for Curriculum

Samuel B. Guze, M.D.

Assistant to the Dean

John D. Vavra, B.A., M.D.

Assistant Dean for Internships

John L. Schultz, B.S., B.S.Ed., M.S., Ed.S.

Assistant Dean for Records and Admissions

Hugh Morrison, B.S.

Assistant Dean for Financial Affairs

William Bahlmann Parker, A.B.

Registrar and Secretary to Executive

Faculty Emeritus and Consultant

to the Dean

John L. Midkiff, Jr., B.S.B.A.

Business Manager

Gerald G. Morris, M.D.

Physician in Charge of Student Health

Service at Medical Center

David H. Brown, B.S., Ph.D.
Coordinator of Preclinical Science Planning
 Estelle Brodman, Ph.D.
Librarian
 Helen Kaiser
Administrative Assistant to the Dean
 Muriel P. Koch
Administrative Secretary to the Dean
 Dorothy Rinderer
Administrative Secretary to the Vice Chancellor
 Jane McCammon, A.B., M.A.
Administrative Assistant for Development to the Vice Chancellor
 Georgana P. Buehler, A.B.
Assistant Registrar
 Daniel Gashler, B.S.
Director of Alumni Affairs and of News Bureau
 Audrey Wingfield, B.A.
Executive Secretary, Medical Center Alumni Association

THE MEDICAL CENTER

Six institutions comprise the Medical Center, known as the Washington University Medical School and Associated Hospitals. They are: Barnard Free Skin and Cancer Hospital, Barnes Hospital, Central Institute for the Deaf, Jewish Hospital of St. Louis, St. Louis Children's Hospital, and Washington University. Members of the Board are elected yearly by the separate institutions.

The Board of Directors

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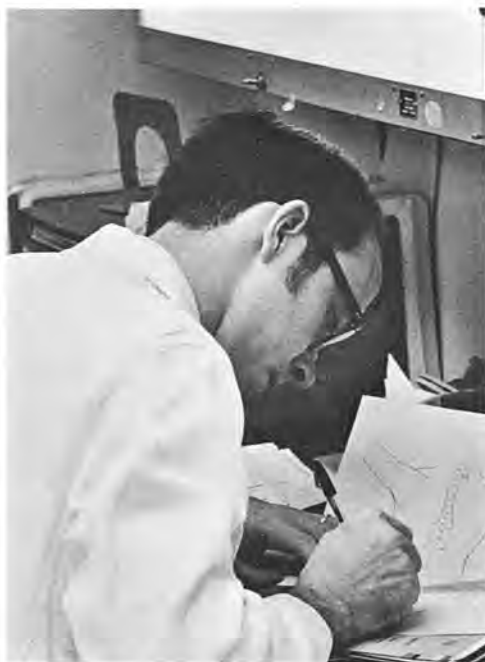
Aims of the School

PHILOSOPHY AND OBJECTIVES

The efforts of the School of Medicine are directed toward providing able students with a stimulating and challenging milieu in which they may pursue the study of medicine—in which they may acquire a thorough background in scientific medicine, as well as a deep understanding of the meaning of comprehensive medical care. In a field that is developing as rapidly as is medicine, education begun in medical school must serve as the foundation for a life-long course of learning. As Sir William Osler pointed out some decades ago, a faculty, no matter how talented, can “only instil principles, put the student in the right path, give him methods, teach him how to study, and early to discern between essentials and non-essentials.” The faculty’s mission is to preserve the joy of learning and to foster a spirit of discrimination and creativity. For today’s student is preparing to cope with a changing world; to contribute, in a constructive, considered way, to resolving problems of medicine and of health care. It is hoped that each student may achieve this grounding during his years in the School of Medicine.

CURRICULUM

The curriculum is the product of prolonged and continuing study, by both faculty and students, of the present and probable future course of medical science and medical practice, and of the ways in which medical education can be kept abreast of this course. The curriculum is planned to provide students, who enter medical school 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 develop-



ment. Modern medical education can no longer hope to be comprehensive; it must be selective. Yet students must develop facility in the understanding and use of several related technical languages: those of anatomy, chemistry, physiology, and clinical medicine. They must share responsibility for the care of the patient. They must also learn how these areas of endeavor are interrelated, how the organization and needs of society influence the methods of providing medical care, how new knowledge is acquired and old knowledge 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 the student to the broad panorama of medicine. The principles, the

methods of investigation, the problems, and the opportunities in each of the major disciplines of medical science and medical practice are presented in such a way as to help the student select the career best suited to his abilities and goals.

The curriculum also embraces a broad elective program, new courses in genetics, social aspects of medicine, cell biology, and radiology; a revised and expanded course in pathophysiology; increased coordination between the courses in pathophysiology and those in pathology and pharmacology; increased coordination between the courses in neuroanatomy and neurophysiology; and a generally more satisfactory sequence of all the preclinical courses.

The elective program helps the student to decide where his major interests lie. It also enables him to benefit from the wide range of specialized knowledge and skills found in the faculty. As there is not enough time for each student to be introduced to each of today's areas of specialization, the elective program permits him to select, according to his own desires, the areas he wishes to explore or to study in depth.

STUDENT RESEARCH FELLOWSHIPS

No matter what medical career an individual chooses, it will be essential for him to evaluate and use fresh knowledge as he moves through his professional life. The Student Research Fellowships, awarded each year to selected students who undertake research projects under the direction of faculty members, are an important part of the educational program. These fellowships offer students an opportunity to attempt original work, thus adding another dimension to their experience as investigators. This research allows students to dis-

cover at first hand the problems of obtaining and assessing new information. Selected faculty members serve as advisers to students interested in special research opportunities.

Fellowships are available to students after admission to the School. They are granted for a minimum of two months. The research must be undertaken during the student's free time or a vacation period. Each year a Senior Research Assembly is held at which the results of student research are presented before the faculty and student body. A number of such studies conducted by students are significant enough to be reported in scientific journals.

OTHER HEALTH PROFESSIONS

Programs in Health Care Administration, Occupational Therapy, Physical Therapy, and Radiologic Technology are conducted as joint enterprises by the School of Medicine and its affiliated institutions. Information about these programs may be found under Allied Health Professions.

Teaching Facilities

WASHINGTON UNIVERSITY AND THE SCHOOL OF MEDICINE

The Washington University School of Medicine is located along the eastern edge of Forest Park in St. Louis' West End. Diagonally across Forest Park, along its western edge, is the general campus of the University. As the scope of scientific and humane scholarship has expanded, the resources of the University have greatly enriched the educational opportunities available to individuals interested in medical and paramedical fields. A regularly scheduled shuttle bus, operated for the benefit of students and faculty, brings the two campuses within ten minutes of each other.

The McDonnell Medical Sciences Building, dedicated in the fall of 1970, is the principal focus of activity for entering medical students. Rising nine floors above ground, it includes administrative offices and two lecture halls on the first floor. Multidisciplinary teaching laboratories for first- and second-year students, and offices and research laboratories for the six existing basic science departments, as well as for the anticipated Department of Genetics, are located on upper floors. Modern, centralized animal quarters are housed in the basement.

The more venerable structures—the West, North, and South buildings, in which has been centered the work of several Nobel Laureates—have been extensively renovated. Along with the Cancer Research Building, they will continue to provide space for laboratories, administrative offices, the library, and some departmental facilities.

Traditionally, the School of Medicine has been strong in the application of science to biology and medicine. An outstanding group of computer scientists and engineers



and their students are engaged in studying the use of computers in tackling biomedical problems.

The Biomedical Computer Laboratory and the Computer Systems Laboratory are located in adjoining buildings at 700 and 724 South Euclid, which also house the Division of Biostatistics of the Department of Preventive Medicine and Public Health.

The School of Medicine Library is one of the largest medical libraries in the Midwest. It is located in the North Building.

The Library contains a collection of over 113,000 volumes and subscribes to more than 2,000 serials. Special holdings include a rare book collection, the School's historical archives, memorabilia, and manuscript copies of the scientific papers of several outstanding men of medicine, including Drs. William Beaumont, Joseph Erlanger, E. V. Cowdry, Evarts Graham, Leo Loeb, Philip Shaffer, and Robert J. Terry.

The Library maintains computer services for storage and retrieval of information, and provides photocopying and interlibrary loan services. It produces computer-based lists of its journals and indexes to its book holdings by title and by subject; a *Catalog of Books*, which is cumulated and published annually; and a record of publications by faculty members. It cooperates with the University library system, and especially with the Dental Library in the Medical Center. Finally, the Library provides services to hospitals represented in the Bi-State Regional Medical Program, and is deeply involved in the Mid-Continental Regional Medical Library.

Library hours are 8:30 a.m. to 12 midnight on weekdays; 8:30 a.m. to 6:00 p.m. on Saturdays; and 1:00 p.m. to 10:00 p.m. on Sundays. A student reading room is open twenty-four hours a day. In the summer and on holidays special hours are maintained.

THE MEDICAL CENTER, ITS HOSPITALS AND INSTITUTES

While the School of Medicine, from its beginnings, has maintained an association with local teaching hospitals, it was not until 1962 that the affiliated institutions were incorporated to form a central organization known as Washington University Medical School and Associated Hospitals (WUMS-AH). Thus, the present Medical Center is a federation of several institutions owned by the University and five institutions owned independently. Students receive clinical instruction and gain experience in all divisions of the Medical Center.

The Barnes Group. Barnes Hospital is the largest hospital in the Medical Center. It is independently owned but, through a special agreement, operates all the hospitals and clinics owned by the University. These contiguous facilities provide the chief source of clinical experience for medical students. The original hospital contained 150 beds; the Group now has a capacity of approximately 1,200 beds—teaching facilities for all clinical departments except Pediatrics. All activities of the Barnes Group and the School of Medicine are closely integrated, and the hospital staffs are composed exclusively of members of the Faculty of Medicine. The 18-story Queeny Tower has six nursing floors and two self-care floors, plus several floors of doctors' offices. A large central diagnostic laboratory provides modern diagnostic patient services. A 12-story in-patient wing, known as East Pavilion, is under construction and scheduled for completion in 1972. Facilities owned by Washington University and operated by Barnes Hospital are as follows:

The McMillan Hospital is a specialty hospital for the treatment of patients with dis-



orders in the fields of ophthalmology and otolaryngology.

Renard Hospital provides 104 beds for patients with psychiatric disorders, and affords laboratories and offices for the Department of Psychiatry.

The St. Louis Maternity Hospital houses offices and research and patient-care facilities for the Department of Obstetrics and Gynecology. A new Perinatal Center and laboratories for research in the physiology of reproduction are planned for this building.

David P. Wohl, Jr., Memorial Hospital, opened in 1953, contains facilities for 84 medical and surgical patients. Offices and laboratories for the Departments of Medicine and Surgery are also situated in Wohl Hospital.

David P. Wohl, Jr., Memorial-Washington University Clinics handle about 120,000 outpatient visits a year. Five floors of the building are devoted to the Clinics and five floors to research, including the Division of Health Care Research.

Other facilities owned by Washington University are:

William Greenleaf Eliot Division of Child Psychiatry. The Division conducts an advanced teaching program in child psychiatry and is the focus for research and treatment in child psychiatry.

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.

It is connected on most of its floors with the adjoining Barnes and Barnard hospitals, and through them with other hospitals of the Group, thus providing easy access for all inpatients.

The Irene Walter Johnson Institute of Rehabilitation. The Institute is a center for training personnel in rehabilitation procedures, for treatment of disabled persons in the St. Louis metropolitan area, and for research related to chronic diseases.

Oscar Johnson Institute for Medical Research. Occupying the top five floors of the McMillan Hospital, it provides office space and research facilities for the Departments of Neurology, Ophthalmology, and Otolaryngology.

Other institutions formally associated with the Medical Center are:

Barnard Free Skin and Cancer Hospital. Although Barnard Hospital is independently owned, it is operated by Barnes Hospital. It is a 44-bed hospital for the care and treatment of patients who suffer from skin diseases and cancer or who are undergoing special tests in the Clinical Research Center.

St. Louis Children's Hospital. From its earliest days, the Children's Hospital, governed by its own directors, has been an integral part of the Medical Center and a leader in the development of academic pediatrics. All professional staff are members of the Faculty of Medicine, and the Medical Director is also professor and head of the Department of Pediatrics at Washington University. Considerable clinical service and research are conducted at Children's. Of particular interest is the recently created Ranken-Jordan Center for Metabolic Diseases.

The Jewish Hospital of St. Louis. This strong, independently owned hospital contains beds for 513 patients. Its departments represent each of the major specialties except pediatrics. The Aaron Waldheim Outpatient Clinics provide all facets of health care to the community, while the Yalem Research Building contains important research facilities for the Hospital and School of Medicine.

Central Institute for the Deaf. This nationally known institution provides facilities for research into hearing problems, maintains a school for deaf and speech-handicapped children, provides outpatient clinics for children and adults, and engages in a program of professional education for scholars in the fields of audiology and otolaryngology.

OTHER INSTITUTIONS

In addition to the previously named facilities which make up the Washington University Medical Center proper, the following hospitals are affiliated with the School of Medicine, and various members of the staffs hold University appointments.

The four City hospitals:

Max C. Starkloff Hospital, with 550 beds.

Homer G. Phillips Hospital, with 450 beds.

Robert Koch Hospital, with 676 beds.

St. Louis Chronic Hospital, with 975 beds.

Malcolm Bliss Mental Health Center, with 250 beds.

Ellis Fischel State Cancer Hospital, Columbia, Missouri, with 104 beds.

St. Louis Veterans Administration Hospital, with 1,319 beds.

St. Louis County Hospital, with 300 beds.

St. Louis Shriner's Hospital for Crippled Children, with 100 beds.

St. Louis State Hospital, with 1,200 beds.

St. Luke's Hospital, with 380 beds.

The Study of Medicine

ENTRANCE REQUIREMENTS

Because Washington University is a private institution, its School of Medicine is not bound by arbitrary state or regional territorial restrictions in its admissions policy; indeed, the School seeks the most able applicants. Applications are reviewed and independently evaluated by four members of the Committee on Admissions and Financial Aid. Final decisions are made by the fourteen-member faculty committee as a whole. All applicants are interviewed prior to their acceptance.

The School is committed to recruiting, enrolling, and educating an increased number of students from racial-minority and educationally deprived groups, and to increasing the number of black physicians in the United States. Two black physician faculty members serve on the Committee on Admissions, and several black students assist in the recruitment of minority students.

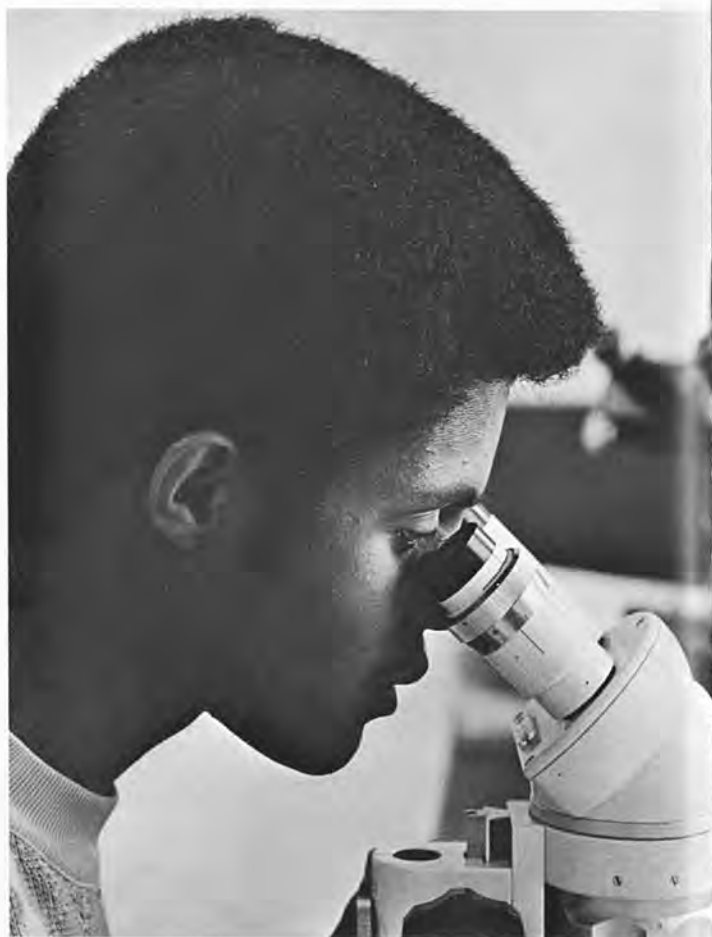
A large scholarship and loan program helps make it possible for the School to lend support to students whose personal resources might otherwise prevent them from obtaining a medical education. At any given time the student body includes representatives from most of the fifty states and from the territories and foreign countries as well.

The course of study leading to the M.D. degree aims to provide students with a knowledge of the fundamentals both of the basic medical sciences and of clinical medicine. This background must serve as the foundation for further and continuing medical education. The School has a strong scientific tradition and emphasizes the scientific basis of medicine. The full implementation of this scientific emphasis includes application of the scientific method to teaching the clinical as well as the basic

sciences. Thoughtful and serious consideration is also given to the emotional, social, and cultural characteristics of patients, to the necessity for adapting medical care to meet community health problems, and to the changing social and economic conditions of our society.

Entrance requirements to the School of Medicine are:

1. evidence of superior intellectual ability and achievement;



2. completion of at least 90 semester hours of college courses in an approved college or university;
3. completion of the Medical College Admission Test of the Association of American Medical Colleges;
4. evidence of character, attitude, and interests suitable for a career in medicine.

Chemistry, physics, and mathematics provide the tools for modern biology, for medicine, and for the biological basis of patient care. Thus, a firm grounding in these subjects is essential for the study of medical sciences. Students entering medical school are expected to have had at least the equivalent of one-year courses at the undergraduate level in physics and in biology; to have studied mathematics through integral calculus; and to have a background in chemistry including organic chemistry. In selected instances, one or more of these prerequisites may be waived by the Committee on Admissions, but applicants are strongly advised to pursue their interests in these and in other areas of science. A course in physical chemistry (with calculus as a prerequisite) is strongly recommended. These recommendations stem from the conviction that the scientific foundation of modern biology will provide in the future, as it has in the past, the main basis for the development of new and powerful means to control disease and relieve human suffering.

No less important is a sound general education to prepare the student for the social, psychologic, and economic aspects of medical practice. Understanding these aspects of medical practice is necessary because, as medical care has become more effective, cost and distribution of medical services, as well as the emotional impact of care on the



patient, have become of increasing concern. Of concern, too, is the growing number of people who live a long time, with the attendant problems brought on by age itself, especially by age combined with disease; and the mounting proportion of patients, regardless of age, who have chronic rather than acute illnesses.

Specific courses, other than the few in the natural sciences, are not presented as prerequisite because a great variety of courses may prepare the student for the many roles he may play in his medical career.

A major goal of college should be development of the intellectual talents of the individual. This often involves the pursuit of some area of knowledge in depth, whether in humanities, social sciences, or natural sciences. At the same time, a diversity of background is encouraged in order to provide a necessary foundation for cultural development. Skill in communication, both verbal and written, is an important requisite in medicine and is appraised in the personal interview, in the Medical College Admission Test, and in a review of the college record.

ADMISSION TO ADVANCED STANDING

Applicants who have satisfactorily completed one or two years of study toward the M.D. degree at an approved medical school may be accepted for admission to the second- or third-year class, when vacancies exist, provided that

1. they comply with the requirements for admission to the first-year class;
2. they have satisfactorily completed courses equivalent in general content and duration to those in this School in the years for which credit is asked;
3. they pass any examinations required by the Committee on Admissions and Financial Aid, in subjects already covered.

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

GRADES

The educational program is designed to meet the needs of all medical students in an individual and a personalized way. To help students who may be having difficulty or who may wish to reinforce their studies, both group and individual tutorials are offered. The School's experience is that tutorials enable students to handle course work with improved proficiency. Students who are found to have difficulties in handling the normal academic course load at the usual rate will be asked to take an individualized program which would require five or more years in order to complete all courses.

In order to assist the student in evaluating his progress, he is graded in each course by the Faculty. In the clinical and elective years, grades are accompanied by detailed descriptive comments characterizing each student's performance. This type of evaluative data is of considerable assistance to the student when he applies for his internship,

since it permits the Assistant Dean for Internships to write each hospital to which the student has applied a meaningful, comprehensive summary of the student's attributes, abilities, and performance.

Grades are: H = Honors
HP = High Pass
P = Pass
F = Fail

"Honors" is given for a truly outstanding performance; "High Pass" for very good work; and "Pass" for the remaining passing grades. At the end of every academic year, each student receives a grade sheet listing his achievement in each course completed. The student's official transcript, in addition to listing courses and grades achieved, gives the grade distribution on each course with the exception of elective courses.

PROMOTIONS

There is a faculty Committee on Promotions for each of the four classes. Each Committee reviews the records of all students in the respective class and acts in accordance with the following rules.

1. A student having failures in two major subjects shall be required to withdraw from the class.
2. A student having one failure in a major course at the end of any year shall be required to remove this failure as directed by the department concerned. When and if the failure is removed, the appropriate Committee on Promotions will reevaluate the student's entire record. A student who does not succeed in removing a failing grade shall be required to withdraw from the class.
3. A student shall not be promoted to the third year until he has received satisfactory credit for all required subjects of the first and second years.
4. A student may be allowed, under exceptional circumstances, to repeat certain courses as a special student or to repeat the work of the entire year as a member of a lower class.

DEGREE PROGRAMS

The School of Medicine offers three programs leading to the M.D. degree: a regular 4-year program, a special 5-year program, and a combined M.D./Ph.D. program.

Individuals interested in a degree in biomedical engineering or neurobiology are referred to these programs on pages 121 and 122 respectively.

Students interested in a straight Ph.D. degree in the medical sciences may obtain information by writing directly to the appropriate basic science department, 660 South Euclid, St. Louis, Missouri 63110; applications and enrollments are handled by the Graduate School of Arts and Sciences.

Doctor of Medicine, Four-Year Program

By conferring the M.D. degree, the School certifies that the student is competent to undertake a career as a Doctor of Medicine. It certifies further that, in addition to medical knowledge and skills, the graduate possesses qualities of personality—compassion, emotional stability, and a responsible attitude—essential to an effective professional life.

A course of medical education for the M.D. degree ordinarily consists of a minimum of four years of study. Students recommended for the degree of Doctor of Medicine must be of good moral character; they must have completed an entire academic course of instruction as matriculated medical students; they must have passed all required subjects, or the equivalent, and have received satisfactory grades in the work of the full academic course; and they must have discharged all current indebtedness to the University. Individuals applying for licensure must be twenty-one years of age and have completed four entire academic years in the study of medicine.

At the end of the final academic year, students who have fulfilled these requirements will be eligible for the M.D. degree.

Doctor of Medicine, Five-Year Program

In addition to the regular four-year program leading to the M.D. degree, this program permits the student to spend one additional year in an investigative or research concentration. The program must be arranged subject to approval of the Committee on Medical Education.

Combined M.D./Ph.D. Program

The Medical Scientist Training Program is designed for selected students who are interested in a research career and whose undergraduate education has placed major emphasis on science. It permits the student to obtain both the M.D. and the Ph.D. degree. Usually six years of study are required to earn both degrees. The major purpose of the program is to prepare medical scientists, skilled in the study of modern biology, for clinical and preclinical faculties of medicine. Individuals interested in entering the Medical Scientist Training Program are asked to write the Office of Admissions, Washington University School of Medicine, 660 South Euclid, St. Louis, Missouri 63110, specifically requesting application forms for the Medical Scientist Training Program. Only a limited number of trainees can be selected for the program. Trainees will be offered full tuition and a stipend for the duration of their training, plus an allowance of \$500 for each dependent. The stipends are: first year, \$2,400; second year, \$2,600; third year, \$2,600; fourth year, \$2,800; fifth year, \$5,000; sixth year, \$6,000.

Eligibility

Applicants must meet requirements for admission to both the School of Medicine and the Graduate School of Arts and Sciences. In addition to the minimum requirements established for acceptance into both schools, students planning to concentrate in disciplines related to the chemical or physical sciences 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 biologic areas of medical science, the requirements for chemistry are less rigorous, but a strong background in mathematics and physics is essential. Although most individuals will enter the program as first-year students, applications will be accepted from students in residence.

The Program

The program consists of three segments: (1) two years of the usual medical curriculum, (2) three or more years of work in preparing a thesis to satisfy requirements for the Ph.D. degree, and (3) a final year which is the usual clinical year of the medical curriculum. Since the fourth year of medical school is completely elective, the medical scientist will have taken the equivalent of that year while preparing his thesis, and thereby he will have completed the total requirements for the M.D. degree.

While the Medical Scientist Training Program includes all those medical courses required for the M.D. degree, it incorporates a high degree of flexibility for individual students through a wide range of electives and the large number of thesis programs available at Washington University.

Each 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.

Usually the following courses will be taken in the first two years.

Year 1

First Semester: Gross Anatomy, Biochemistry, Microbiology, Social Aspects of Medicine.

Second Semester: Microscopic Anatomy, Physiology, Cell Biology, Neural Sciences, Genetics, Topics in Clinical Medicine, Biostatistics.

Year 2

Third Semester: Pathology, Pathophysiology, Physical Diagnosis, History of Medicine.

Fourth Semester: Pathophysiology, Radi-

ology, Neurology, Surgery, Pediatrics, Ophthalmology, Otolaryngology, Pharmacology, Preventive Medicine, Psychiatry, Obstetrics and Gynecology, Laboratory Diagnosis, Clinical Diagnosis.

Students begin their training on July 1 of the year they enter the School of Medicine. A student who passes a qualifying examination in any of the regularly offered pre-clinical courses will be allowed to substitute either advanced course work or laboratory research in the time made available. In this way many students will have an opportunity to begin supervised research immediately after entry. Research can be continued in free periods during the first two years.

The courses differ from the usual medical courses with respect to the laboratory training periods and the availability of additional electives. As students enrolled in the program will have begun laboratory work during the summer and will receive additional intensive laboratory training, they may elect, with approval of the Medical Scientist Student Advisory Committee, to omit the laboratory component of a course or to take selected parts of a laboratory component. The time not utilized in the normal laboratory components will be spent in research laboratories and in elective tutorial courses which 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.

The performance of each student will be reviewed annually, and he will be expected to maintain a high scholastic standing.

The similarity in course content between the Medical Scientist Training Program and the first two years of the program for the M.D. degree makes it possible for a student to return without loss of time to the regular curriculum after the first two years if this seems advisable.

The student will spend the third, fourth, and fifth years, and possibly a sixth year, in satisfying the requirements of the Graduate School of Arts and Sciences for the Ph.D. degree. Before beginning the third year, the student will select a faculty adviser under whom he will do his thesis research and the department or departments in which he will work toward the Ph.D. degree. As prerequisites vary for the different departments, the student should make appropriate inquiries and arrangements well in advance.

Thesis programs are available in the departments of Anatomy, Biological Chemistry, Microbiology, Pathology, Pharmacology, and Physiology and Biophysics. In addition, thesis work may be undertaken in Molecular Biology, Neurobiology, or Biomedical Engineering. The latter three disciplines are administered by interdepartmental committees, and the faculty includes representatives from the departments of Biology, Chemistry, Chemical Engineering, Electrical Engineering, Mechanical Engineering, Neurology, Ophthalmology, Otolaryngology, Physics, and Psychiatry.

The formal requirements for the Ph.D. degree include (1) completion of course work; (2) successful performance in a qualifying examination, usually at the end of the third year; (3) successful performance in one foreign language examination; (4) execution of original research suitable for a dissertation; and (5) defense of the thesis.

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 at increasing awareness of major research problems in clinical medicine.

The sixth year is the clinical 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 M.D. degrees will be granted simultaneously at the end of the final clinical year.

INTERNSHIPS AND RESIDENCIES

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 perhaps 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 Assistant Dean for Internships. Thus, in their junior year, students are provided with general background information about the kinds of internships available. Since many more internships exist than there are candidates in any given year, students are able to exert a considerable measure of selection.

In the office of the Assistant Dean for Internships an open file is maintained of brochures and other descriptive data regarding internships throughout the country. Included are evaluations of their own internships obtained from our recent graduates. The School participates in the National Intern and Resident Matching Program, which offers distinct advantages to applicants.

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

Historical Perspective

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 three 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 both schools 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, first 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."

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 School of Medicine 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 distinc-

tion 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 for students 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. Members of the faculty have received numerous awards; eight Nobel Laureates have worked in the laboratories of the School's medical science departments.

In the ensuing years, the Medical Center has continued to grow and to provide excellent facilities. 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 consistently recorded, and the School of Medicine has continued to attract students and faculty of the highest caliber.



Student Life

HOUSING

The Off-Campus Referral Service in Karl D. Umrath Hall on the hilltop campus maintains listings of housing appropriate for married and single students.

The Spencer T. Olin Residence Hall has accommodations for approximately 300 single men and women. It was made possible by generous gifts from Spencer T. Olin and alumni and friends of the School of Medicine. Located at 4550 Scott Avenue in the Medical Center, Olin Hall is planned for the convenience of the student in the medical or paramedical sciences. Every effort is made to provide an atmosphere that not only aids him in meeting his study obligations, but also recognizes his privileges as a graduate student.

The rates for the rooms are as follows:

School year: September to June
(9 months)

\$525 per student in 2-room suite
(2 students per suite)

475 per student in single room

400 per student in double room

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

Daily Rates for Visitors

\$6.00 per person in 2-room suite

5.00 per person in single room

4.00 per person if prospective student

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.

Parking is available on a lot behind Olin Hall and in other lots operated by the Medical School. A monthly or annual permit must be purchased.

STUDENT HEALTH SERVICE

Entering students are given a complete medical examination and are provided with medical care as long as they are enrolled at the School of Medicine. Physicians are available at the Student Health Service, and a physician is on call for emergency care at Barnes Hospital or in the student's room when necessary. Essential costs of hospitalization are covered through a liberal group insurance policy. 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.

RECREATIONAL AND CULTURAL OPPORTUNITIES

The City of St. Louis offers many cultural and recreational facilities, among which are Forest Park with its lagoons, sports areas, and the Zoo; the City Art Museum; the Museum of the Missouri Historical Society; and the McDonnell Planetarium. The St. Louis Symphony Orchestra presents a series of concerts during the season, and the Municipal Opera stages musicals in an outdoor

theater during the summer. One of the country's most notable horticultural gardens, the Missouri Botanical Garden, is located in St. Louis.

Professional sports are an important part of the St. Louis scene. The football and baseball Cardinals play in the handsome Busch Stadium downtown, and the St. Louis Blues hockey team plays at the Arena, not far from the School.

Within the University community excellent concerts, theater, lectures, and other cultural activities are open to students in the School of Medicine. Facilities for indoor and outdoor sports, including tennis courts and the Wilson Pool, are available on the hilltop campus. Olin Residence Hall houses an excellent full-sized gymnasium for student use.

STUDENT ACTIVITIES

Senior Research Assembly. 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.

Graham Colloquium. A gift from Mr. and Mrs. Evarts Graham, Jr., in 1963 enabled the School to establish a series of informal discussions led by outstanding scholars from fields other than medicine and the biological sciences. Mr. and Mrs. 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. The Graham Colloquia feature guests selected by the students, and are planned to foster an informal, lively exchange of views.

Pruitt-Igoe Medical Action Program. Medical students and faculty members working closely with members of the community have established a small outpatient clinic at Pruitt-Igoe, an inner-city, high-rise, public housing project. The facilities are open to patients every evening, Monday through Friday. Medical teams on duty consist of medical students under the supervision of a physician. Their responsibilities include primary care, triage, referral to appropriate health units in the City, and follow-up care.

THE MEDICAL CENTER ALUMNI ASSOCIATION

The Medical Center Alumni Association plays a significant part in the life of the School. It was organized to promote a spirit of class fellowship among its members, to further the aims and purposes of the School, and to stimulate interest in the advancement of medical and collateral sciences.

Membership is made up of all graduates of the School of Medicine, all members of the faculty, and all former house officers of the Medical Center. Each year the Association gives a welcoming party for the incoming freshman class and, prior to Commencement on Alumni Day, sponsors the annual alumni banquet at which graduating seniors are guests. The Alumni Day reunion features 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.

The Alumni Office prepares and distributes a schedule of departmental teaching conferences held each week in the Medical Center and open to physician attendance.

LECTURESHIPS AND VISITING PROFESSORSHIPS

Several established lectures enable the School to bring to the Medical Center each year distinguished guests who contribute significantly to the richness of student life.

Harry Alexander Visiting Professorship. Established by former house officers and friends of Dr. Harry Alexander to provide an annual visiting professor in the Department of Medicine.

Alpha Omega Alpha Lectureship. Given each year by a faculty member of the students' selection.

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

The James Barrett Brown Visiting Professorship in Plastic and Reconstructive Surgery. Created by patients, friends, colleagues, and former students to honor Dr. Brown.

Glover H. Copher Lectureship in Cancer. Founded in 1971 with endowment provided by Dr. Copher and friends.

Joseph J. Gitt Visiting Professorship in Clinical Neurology. Established in 1971 by his family and friends to honor Dr. Gitt.

Evarts A. Graham Memorial Lectureship. Established with a reserve fund left by Dr. Graham for his successors.

Evarts A. Graham Visiting Professorship of Surgery. Established by the Harry Freund Memorial Foundation to support an annual lecture in honor of Dr. Graham's contributions to surgery.

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

Alexis F. Hartmann, Sr., Lectureship. Established by friends interested in pediatrics to provide an annual lecture in Dr. Hartmann's honor.

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

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

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

Admission and Fees

APPLICATION PROCEDURE

A copy of the Bulletin may be obtained by writing to the Office of Admissions, Washington University School of Medicine, 660 South Euclid Avenue, St. Louis, Missouri 63110. Preliminary applications are handled by the American Medical College Application Service (AMCAS), Association of American Medical Colleges. To obtain the preliminary form, students must send in an AMCAS application request card. These cards are available from our Office of Admissions.

The Committee on Admissions of the Washington University School of Medicine promptly evaluates the initial application and informs each applicant whether or not he may complete his application by having letters of recommendation submitted. The Office of Admissions provides these applicants with the necessary credentials application materials. At this stage, a non-refundable service fee of \$15.00 is charged by Washington University. The applicant is notified as soon as a decision has been made on his application.

FEES AND OTHER EXPENSES

The University reserves the right to change the fees herein stated at any time without notice. However, if a change is made, it will not become effective until the next academic year. All fees and charges are payable in advance at the Office of Admissions, School of Medicine. Checks should be made payable to Washington University.

For the academic year 1971-72, tuition and fees total \$2,200. This figure includes student health coverage.

Withdrawals and Refunds

A student who withdraws within the first two weeks of classes is charged 20% of the semester tuition fee; a student who withdraws during the third week is held for 40% of the charges; during the fourth week for 60%; during the fifth week for 80%. 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.

Estimate of Expenses

An estimate of the average expenses of a single student in the School of Medicine is given below. In addition to these expenses, every student is required to have a standard microscope, which may be rented or purchased from the Bookstore of the School of Medicine. The microscope rental fee is currently \$80 per academic year.

	1971-72
Tuition and fees	\$2,200
Books and instruments (average)	250
Room and board (average) and incidentals	2,000
	<u>\$4,450</u>

Financial Assistance, Prizes, Awards

Comprehensive in scope, the financial aid program of the School of Medicine encompasses scholarships, loans, fellowships, and several prizes and awards. Every assistance is afforded to students to obtain necessary funds and to avoid excessive indebtedness.

As all students accepted for admission have proven scholastic ability, scholarships are granted primarily on a basis of financial need. Immediately upon notification of acceptance for admission, the applicant may file with the Admissions Office an application for financial aid in the form of scholarship and loan support. All information is evaluated by the Committee on Admissions and Financial Aid and is held in strict confidence. Scholarships and loans can be awarded only if it is apparent that the applicant has budgeted his expenditures to a practical minimum, and only if he has made a reasonable effort to secure the necessary financial support as gifts or loans from family sources.

All awards are made for a given academic year; however, students may renew financial assistance in succeeding years of medical school if they remain in good academic and personal standing, and if there is continued financial need. Awards made to a student 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 each year. Medical students married to schoolmates should submit a single application, together with financial statements from each student's parents. 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. The Personnel Office pro-

vides assistance to students' wives seeking employment.

The Committee holds that students receiving assistance have an obligation to notify the Committee if their financial situation changes, for example, through employment or receipt of a scholarship not anticipated at the time the application was submitted. Many students who consider themselves independent of their parents successfully arrange clearly specific loans from parents.

SCHOLARSHIP FUNDS

Alexander Berg Research Scholarship. Awarded to students doing summer research in bacteriology.

Grace Strong Coburn Scholarship Fund. Created in 1962 through the bequest of Mrs. Grace Strong Coburn for scholarships in the School of Medicine.

The T. Griswold Comstock Scholarships. Established under the will of Marilla E. Comstock for students who would otherwise be unable to obtain a medical education.

The George F. Cill Scholarship Fund. Instituted in memory of a former clinical professor of pediatrics.

Harvielle-Bailey Scholarship. Established in 1970 under the will of Miss Isabel Bailey Harvielle as a memorial to Dr. Charles Poplin Harvielle and Dr. Steele Bailey, Jr., alumni of the School.

Health Professions Scholarship Grant. Established by federal legislation to enable students from low income families to undertake the course of study required to become physicians.

Jackson Johnson Scholarship Fund. Provided through a bequest in 1930 from Jackson Johnson.

George D. Kettelkamp Scholarship Fund. Established in 1969 by Mrs. Kettelkamp in memory of her husband, an alumnus of the School of Medicine.

The Eliza McMillan Scholarship Fund. Provides assistance to young women in any of several schools of the University to secure an education.

Medical Center Alumni Scholarship Fund. Awarded on the basis of academic achievement and financial need.

Roy B. and Viola Miller Memorial Fund. Created in 1963 through the bequest of Roy B. Miller to provide scholarships for medical students and for postgraduate students engaged in study and research in the medical sciences.

Pfizer Laboratories Division Medical Scholarship. Awarded annually to a medical student of high scholastic standing; funds provided by Pfizer Laboratories.

Robert Allen Roblee Scholarship Fund. Established in 1948 through the gift of Mrs. Joseph H. Roblee for students in the School of Medicine.

Thomas W. and Elizabeth J. Rucker Scholarship Fund. Created in 1956 under the will of Eugenia I. Rucker, in memory of her mother and father.

Joseph H. Scharf Scholarship Fund. Provided in 1949 through the bequest of Dr. Joseph H. Scharf.

Dr. John B. Shapleigh Scholarship Fund. Established in 1926 with the bequest of Dr. John B. Shapleigh and supplemented by contributions from Mrs. Shapleigh and Miss Margaret Shapleigh.

Alexander Balridge Shaw Scholarship Fund. Created in 1958 through the bequest of Roy A. Shaw in memory of his father, Dr. Alexander Balridge Shaw.

Beulah B. Strickling Scholarship Fund. Established in 1960 with a bequest from Mrs. Beulah B. Strickling.

Edwin H. and Virginia M. Terrell Scholarship Fund. Established in 1964 with the bequest of Dr. Edwin H. Terrill, an alumnus. It was Dr. Terrill's hope that scholarship recipients would repay into the Fund the amount of the award.

SCHOLARSHIP AND LOAN FUNDS

Isabel Vallé Brookings Scholarship and Loan Fund. Established in 1957 by Isabel Vallé Brookings (Mrs. Robert S.) for scholarships and loans in the School of Medicine.

The Danforth Foundation Loan and Scholarship Fund. Provides financial assistance for medical students.

The Danforth Medical Fund. Created through gifts from the Danforth Foundation and the late William H. Danforth to furnish loans, scholarships, or outright grants to talented and promising young men and women engaged in study or research in basic medical or clinical sciences.

The Wilkinson Scholarship Fund. Created in 1968 by the bequest of Anna J. Wilkinson in honor of her husband, Dr. George E. Wilkinson. Medical and postdoctoral students are eligible for Wilkinson scholarships or loans.

LOAN FUNDS

The American Medical Association Loan Program. Makes available bank loans without collateral to eligible 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.

Health Professions Student Loan Fund. Established by federal legislation for medical students with a demonstrated financial need. Loans are available for long terms at favorable rates.

Ursula Hecker Loan Fund. Established in 1967 by a bequest from Ursula Lee Hecker for the use and benefit of worthy, deserving, and needy medical students.

W. K. Kellogg Foundation Loan Fund. Provides financial assistance to medical students in need of such aid.

Gustel and Edith H. Kiewitt Scholarship Loan Fund. Provides loan funds for medical students.

G. H. Reinhardt Memorial Scholarship Loan Fund. Established in 1947 through the bequest of G. H. Reinhardt.

The Aline Rixman Loan Fund. Created in 1940 by William Rixman in memory of his wife, the fund is used to alleviate unexpected financial emergencies of medical students.

Caroline O. Schlesinger Loan Fund. Established in 1969 to provide financial support for medical students.

FELLOWSHIP AND OTHER FUNDS

Alexander and Gertrude Berg Fellowship Fund. Created in 1952 through the bequest of Gertrude Berg to provide a fellowship in the Department of Microbiology.

Glover H. Copher Fellow in Surgical Research. Established in 1971 to support a postdoctoral fellow in surgery.

William H. Danforth Loan Fund for Interns and Residents in Surgery. Provides financial assistance in the form of loans for postdoctoral students in surgery.

J. Albert Key Fellowship Fund. Provides a stipend for a fellow in orthopedic surgery.

Ophelia H. Kooden Loan Fund. Created in 1970 to provide loans for medical graduates in memory of Mrs. Kooden's brother, Jess Klement Goldberg.

Louis and Dorothy Kovitz Fellowship in Surgical Research. Established in 1970 by an alumnus and his wife to encourage medical students to pursue their interest in surgery.

George W. Merck Memorial Loan Fund. Established in 1959 through the Merck Company Foundation to encourage deserving interns and residents to seek the best possible post-doctoral training.

Student Research Fellowships. Awarded each year to students who undertake special research projects under the direction of a faculty member. They carry a stipend. Application should be made to the Committee on Fellowships and Awards, which supervises the program. These fellowships are described more completely on page 9.

AIDS IN ALLIED HEALTH PROFESSIONS

Frank R. Bradley Scholarship Loan Fund. Established in 1958 by the Alumni Association of the Graduate Program in Health

Care Administration as a loan fund in honor of Dr. Frank R. Bradley.

W. K. Kellogg Foundation Loan Fund for Graduate Students in Hospital Administration. Established in 1958 and supplemented in 1964.

Mary A. Lennon Memorial Scholarship Loan Fund in Health Care Administration. Established in 1958 by Mrs. Maureen Lennon Callaghan and Lieutenant Colonel Donald E. Callaghan to provide loans for students in the Graduate Program in Health Care Administration.

Washington University Health Care Administration Scholarship and Emergency Fund. Started in 1968 to provide help on the basis of need without interest or expectation of repayment.

Foster G. McGaw Scholarship Fund. Awarded to two students entering the Graduate Program in Health Care Administration. Selection is based on financial need and potential for contribution to the profession.

Bertha Reinhardt Green Memorial Fund. Created in 1954 by a bequest from Bertha Reinhardt Green as a loan fund for students enrolled in the Program in Occupational Therapy.

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

W. K. Kellogg Foundation Loan Fund for Students in Physical Therapy. Created in 1943 for students in the Program in Physical Therapy.

Gustel and Edith A. Kiewitt Scholarship Loan Fund. Provides loan funds for students in Physical and Occupational Therapy.

Rehabilitation Services Administration Traineeships in Physical Therapy. Provide tuition funds and a monthly stipend for a limited number of students in Physical Therapy.

AWARDS AND PRIZES

Alpha Omega Alpha Book Prize. Awarded at the end of the fourth year to a member of that class who has performed outstandingly for the entire medical course.

The Jacques J. Bronfenbrenner Prize. Provided by Dr. Bronfenbrenner's students in memory of his inspiration as a teacher and scientist, and 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 infectious diseases or related fields.

Dr. Richard Brookings and Dr. Robert Carter Medical School Prizes. Provided for medical students through a bequest of Robert S. Brookings.

The Kehar S. Chouké Prize. Awarded at the end of the first year to a medical student who has demonstrated superior scholarship in anatomy.

The Carl F. and Gerty T. Cori Prize in Biochemistry. Awarded at the end of the first year to the member of the class who has demonstrated superior scholarship in biochemistry.

Edmund V. Cowdry Prize in Histology. Established in 1969 to honor Dr. Cowdry; awarded to a freshman medical student who has performed meritoriously in microscopic anatomy.

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

George F. Gill Prizes. One prize awarded at the end of the first year to a member of the class who has demonstrated superior scholarship in anatomy; one prize awarded to a member of the graduating class who has demonstrated superior scholarship in pediatrics.

Dr. Joseph J. Gitt and Charlotte E. Gitt Prize. Awarded to a senior student for the best original work in the field of clinical and therapeutic medicine.

Lange Medical Publications Book Awards. Given to members of all four classes for high scholastic standing and achievement in research.

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

Medical Center Alumni Scholarship Prize. Given annually to a student who has shown excellence in his work during the preceding year.

Medical Fund Society Prizes. One prize awarded annually to a student of the senior class who has excelled in the study of internal medicine; one prize awarded annually to a student of the senior class who has excelled in the study of surgery. No individual is eligible for both prizes.

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

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

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

St. Louis Pediatric Society Senior Prize. Presented to the student showing the greatest promise in clinical pediatrics.

Sandoz Award. Given annually to a graduating student who has made a meritorious contribution to psychiatric research.

The Sidney I. Schwab Book Prizes. Awarded at the end of the fourth year for general excellence in neurology and psychiatry.

Margaret G. Smith Award. Given to a woman medical student for outstanding achievement in the first two years of medical school.

The Samuel D. Soule Award in Obstetrics and Gynecology. Presented to a member of the junior or senior class for meritorious achievement in either basic or clinical investigation in obstetrics and gynecology.

The Upjohn Achievement Award. Given to the senior student who has done the most meritorious work during his medical school career in the field of metabolism.

The Dr. Samson F. Wennerman Prize. Donated by his wife, Zelda E. Wennerman, and awarded annually to that senior student who has demonstrated promise in surgery.

Hugh M. Wilson Award for Meritorious Work in Radiology. Given annually to a graduating medical student in recognition of outstanding work in radiology-related subjects, either clinical or basic science.

The James Henry Yalem Prize in Dermatology. Established by Charles Yalem in memory of his son and awarded annually to a member of the senior class for outstanding work in dermatology.



Course of Instruction

CLASS SCHEDULE FIRST YEAR

The first academic year is 36 weeks long and is divided into semesters.

First Semester — September 7, 1971, through January 22, 1972

Hours	Monday	Tuesday	Wednesday	Thursday	Friday
9 to 10	Biochemistry	Anatomy	Biochemistry	Biochemistry or Microbiology Laboratory*	Biochemistry
10 to 11	Microbiology		Microbiology		Social Aspects of Medicine
11 to 12					
12 to 1	Lunch	Lunch	Lunch		Biochemistry
1 to 2	Anatomy	Biochemistry	Biochemistry	Lunch	Lunch
2 to 3		Biochemistry or Microbiology Laboratory*	Biochem. or Mi- crobiology Lab*	Anatomy	Microbiology
3 to 4			Biochemistry		
4 to 5					

*Each department will have a total of nine weeks (not necessarily consecutive).

Second Semester (First 9 weeks) — January 24, 1972, to March 24, 1972

Hours	Monday	Tuesday	Wednesday	Thursday	Friday
9 to 10	Cell Biology	Physiology	Cell Biology	Physiology	Cell Biology
10 to 11				Neural Sciences	Physiology
11 to 12				Topics in Clinical Medicine	
12 to 12:30					
12:30 to 1	Lunch	Lunch	Lunch	Lunch	
1 to 1:30	Lunch				
1:30 to 2	Microscopic Anatomy		Microscopic Anatomy	Free	Physiology
2 to 3		Biostatistics			
3 to 4		Genetics			
4 to 5					



Second Semester (Second 9 weeks) — March 27, 1972, to May 26, 1972

Hours	Monday	Tuesday	Wednesday	Thursday	Friday
9 to 10	Neural Sciences	Physiology	Neural Sciences	Physiology	Neural Sciences
10 to 11				Neural Sciences	Physiology
11 to 12		Neural Sciences		Topics in Clinical Medicine	
12 to 12:30					
12:30 to 1	Lunch		Lunch		Lunch
1 to 1:30		Lunch			
1:30 to 2	Microscopic Anatomy		Microscopic Anatomy	Free	Physiology
2 to 3		Biostatistics			
3 to 4		Genetics			
4 to 5					



CLASS SCHEDULE **SECOND YEAR**

The second academic year is 36 weeks long and is divided into semesters.



First Semester (18 Weeks) — September 7, 1971 to January 21, 1972

Hours	Monday	Tuesday	Wednesday	Thursday	Friday
9 to 10	Pathology	Physical Diagnosis	Pharmacology*	Psychiatry	Pathology
10 to 11				Pathophysiology	
11 to 12			Psychiatry†	Pathology	
12 to 1					
1 to 2	Lunch	Lunch	Lunch	Free	Lunch
2 to 3	Pathophysiology	Pathophysiology	Pharmacology**		Pathophysiology
3 to 4			Radiology**		
4 to 5					



Second Semester (First 6 Weeks) — January 24, 1972 to March 3, 1972

Hours	Monday	Tuesday	Wednesday	Thursday	Friday
9 to 10	Pathology	Clinical Diagnosis	Pharmacology*	Surgery	Pathology
10 to 11				Pathophysiology	
11 to 12		EYE/ENT		Pathology	
12 to 1					
1 to 2	Lunch	Lunch	Lunch	Free	Lunch
2 to 3	Pathophysiology	Pathophysiology	Pharmacology**		Pathophysiology
3 to 4			Radiology**		
4 to 5					
5 to 6					

Second Semester (Second 6 Weeks) — March 6, 1972 to April 14, 1972

Hours	Monday	Tuesday	Wednesday	Thursday	Friday
9 to 10	Pathology	Clinical Diagnosis	Pharmacology*	Surgery	Pathology
10 to 11				Pathophysiology	
11 to 12		EYE/ENT			
12 to 1					
1 to 2	Lunch	Lunch	Lunch	Free	Lunch
2 to 3	Pathophysiology	Pathophysiology	Pharmacology**		Pathophysiology
3 to 4			Radiology**		
4 to 5					

Second Semester (Third 6 Weeks) — April 17, 1972 to May 26, 1972

Hours	Monday	Tuesday	Wednesday	Thursday	Friday
9 to 10	Pathology	Clinical Diagnosis	Pharmacology*	Surgery	Pathology
10 to 11				Pediatrics	
11 to 12		EYE/ENT			
12 to 1					
1 to 2	Lunch	Lunch	Lunch	Free	Lunch
2 to 3	OB/GYN	Pediatrics	Pharmacology**		OB/GYN
3 to 4			Radiology**		
4 to 5		Free			

*Pharmacology — 9-12 p.m. on odd numbered weeks and 9-1 p.m. on even numbered weeks.

**Pharmacology — 2-5 p.m. on even numbered weeks and Radiology from 2-4 p.m. on odd numbered weeks.

CLASS SCHEDULE THIRD YEAR

The clinical clerkship is 48 weeks long and is divided into quarters.

Medicine Service, 12 weeks

Group A
Summer Quarter, June 14 through
September 4, 1971.

Group B
Fall Quarter, September 7 through
November 27, 1971.

Group C
Winter Quarter, November 29 through
December 18, 1971, and January 3
through March 4, 1972.

Group D
Spring Quarter, March 6 through
May 27, 1972.

C.P.C.	Medicine Clinic
Thursday 12 to 1:00	Saturday 12 to 1:00

Note: The CPC and Medicine Clinic are required for students on the Medicine Service and are optional for third-year students on other services.

Surgery Service, 12 weeks

Group D
Summer Quarter, June 14 through
September 4, 1971

Group A
Fall Quarter, September 7 through
November 27, 1971

Group B
Winter Quarter, November 29 through
December 18, 1971, and January 3
through March 4, 1972.

Group C
Spring Quarter, March 6 through
May 27, 1972.



Psychiatry Service, 6 weeks

Neurology Service, 3 weeks

ENT Service, 2 weeks

Eye Service, 1 week

Group B

Summer Quarter, June 14 through
September 4, 1971.

Group C

Fall Quarter, September 7 through
November 27, 1971.

Group D

Winter Quarter, November 29 through
December 18, 1971, and January 3 through
March 4, 1972.

Group A

Spring Quarter, March 6 through May 27,
1972.

Section I, Psychiatry.

Section II, Neurology, ENT, and Eye.

Sections change at end of six-week period.

Pediatrics Service, 6 weeks

**Obstetrics and Gynecology Service,
6 weeks**

Group C

Summer Quarter, June 14 through
September 4, 1971.

Group D

Fall Quarter, September 7 through
November 27, 1971.

Group A

Winter Quarter, November 29 through
December 18, 1971, and January 3
through March 4, 1972.

Group B

Spring Quarter, March 6 through
May 27, 1972.

Section I, Pediatrics.

Section II, Obstetrics and Gynecology.

Sections change at end of six-week period.



CLASS SCHEDULE FOURTH YEAR

Elective Year. This is a 48-week year, divided into eight six-week sessions. Each student is required to attend for only 36 weeks.

"A" Electives

These seminar courses meet 2 to 4 hours a week for 12 or 18 weeks, and most are 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 take these seminars concurrently with "B" electives, but selected students may take them during semester 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 as outlined in the senior elective book. Most students take "B" electives after completing the clinical year, but these electives can precede the clinical year, or be interspersed among the quarters of the clinical year. An individual student may even decide to take his elective year after completing semesters one and two. Each student must take at least 36 weeks of these full-time elective courses.



**TABLE OF REQUIRED HOURS
1971-72**

As reported to the Liaison Committee on Medical Education, representing the Council on Medical Education of the American Medical Association and the Executive Council of the Association of American Medical Colleges, credit hours for courses are expressed in terms of clock hours—the scheduled hours per year of actual lecture and laboratory contact between faculty and students. These clock hours are not to be interpreted as semester or quarter hours.

Year 1	Clock Hours
Anatomy	306
Biochemistry	216
Microbiology	180
Social Aspects of Medicine	36
Physiology	162
Cell Biology	72
Neural Sciences	126
Genetics	36
Topics in Clinical Medicine	36
Biostatistics	18
	<hr/> 1,188

Year 2	
Pathology	312
Pharmacology	180
Pathophysiology (including Laboratory Medicine and Epidemiology)	318
Physical Diagnosis	72
Clinical Diagnosis	54
Psychiatry	42
Radiology	36
Obstetrics and Gynecology	36
Surgery	36
Pediatrics	24
Ophthalmology and Otolaryngology ..	18
	<hr/> 1,128

Year 3: Clinical Year

Medicine	462
Surgery	462
Obstetrics and Gynecology	231
Pediatrics	231
Psychiatry	231
Neurology	115½
Otolaryngology	77
Ophthalmology	38½
	<hr/> 1,848

Year 4: Elective

1,188

Each student must take at least two "A" electives (seminars which meet two or more hours each week for 12 or 18 weeks) and at least 36 weeks of "B" electives (usually either a clinical clerkship or research).

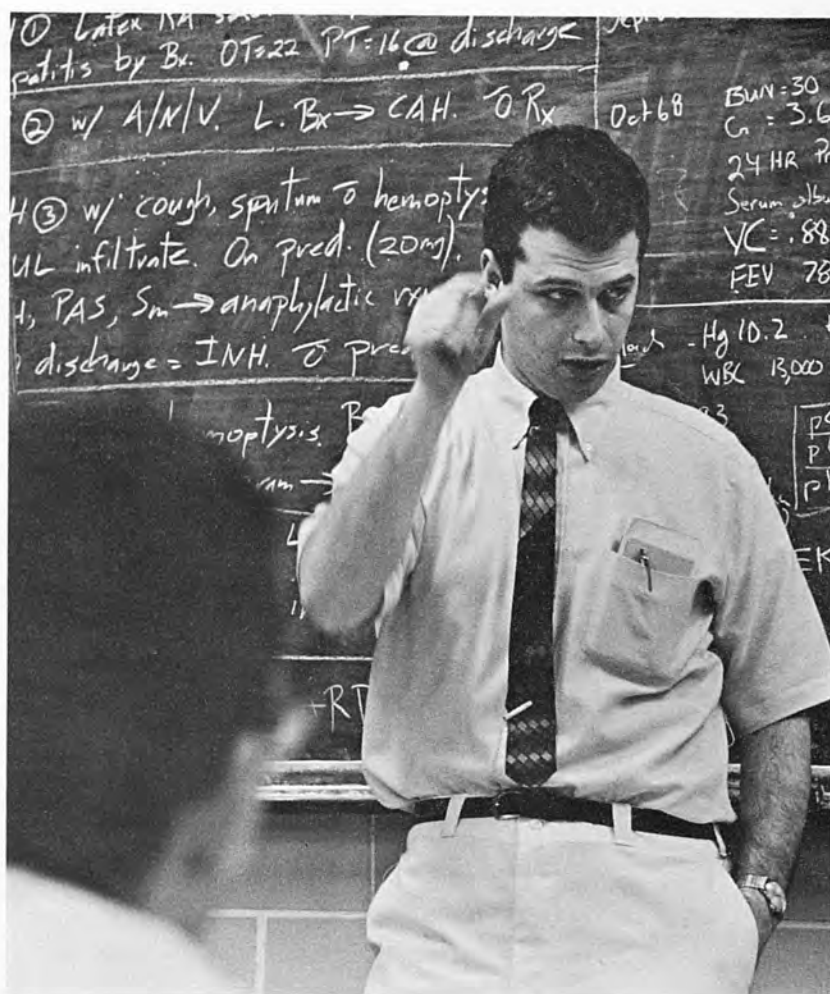
Total for four years 5,352

Postdoctoral Training

Those departments which offer Postdoctoral Fellowships individualize such educational activity up to a maximum of 36 months of academic time. Such Postdoctoral Fellowships lead integrally to certification by the appropriate specialty and/or subspecialty boards of the American Medical Association. Postdoctoral Programs offered by departments of the School and leading to certification by the School are individualized up to a maximum of 36 months of academic time.



Departments of the School of Medicine



Department of Anatomy



The anatomical sciences are presented in three required courses: gross anatomy and microscopic anatomy, which are offered in the first semester; and neuroanatomy, which is taught conjointly with neurophysiology in the second semester. In addition, the Department offers a series of elective courses for senior students. Gross anatomy is taught essentially as a laboratory course, but with some lectures dealing with anatomical principles and with human growth and development. The course in microscopic anatomy consists largely of cell and tissue biology, with laboratory sessions paralleling the lectures in these areas. Neuroanatomy is taught mainly from an experimental point of view, with particular emphasis upon the development and structure of the neural tissues. Throughout all three courses attention is paid to the results of recent investi-

gations and to major developments in each field. The Department is well equipped for special work in several areas, including gross anatomy, electron microscopy, tissue culture, neuroanatomy, cell biology, and developmental biology.

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.

Professors

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

Richard P. Bunge, B.A., University of Wisconsin, 1954, M.S., 1956; M.D., 1960.

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

Allen C. Enders, A.B., Swarthmore College, 1950; A.M., Harvard University, 1952; Ph.D., 1955. (See Department of Pathology)

Joe W. Grisham, A.B., Vanderbilt University, 1953; M.D., 1957. (See Department of Pathology)

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

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

Richard Torack, B.S., Seton Hall University, 1948; M.D., Georgetown University, 1952 (See Department of Pathology)

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, 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 Radiology) (Also Lecturer)

Associate Professors

Milton N. Goldstein, B.S., Western Reserve University, 1946; M.S., 1947; Ph.D., 1952. (See Department of Pathology)

Edward G. Jones, M.B., Ch.B., University of Otago, 1962; Ph.D., Oxford University, 1968; M.D., University of Otago, 1970. (Effective January 1, 1972)

Joseph R. Williamson, A.B., Phillips University, 1954; M.D., Washington University, 1958. (See Department of Pathology)

Research Associate Professor Emeritus

Valentina Suntzeff, M.D., Women's Medical Institute (Petrograd, Russia), 1917. (Also Lecturer)

Assistant Professors

E. Richard Bischoff, A.B., Knox College, 1960; Ph.D., Washington University, 1966.

Harold Burton, B.A., University of Michigan, 1964; Ph.D., University of Wisconsin, 1968. (See Department of Physiology and Biophysics)

Arnold J. Kahn, B.A., University of Louisville, 1957; M.S., 1958; Ph.D., Columbia University, 1962.

Peregrina N. C. Labay, B.S., University of St. Thomas, 1949; M.D., 1954. (See Department of Surgery)

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

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

David N. Menton, B.S., Mankato State College, 1959; Ph.D., Brown University, 1966. (See Department of Pathology)

Joseph L. Price, B.A., University of the South, 1963; Ph.D., Oxford University, 1969.

Thomas A. Woolsey, B.S., University of Wisconsin, 1952; M.D., Johns Hopkins University, 1969.

Research Assistant Professor

Mary B. Bunge, B.S., Simmons College, 1953; M.S., University of Wisconsin, 1955; Ph.D., 1960.

Research Assistants

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

Paul R. Myers, A.A.S., M.T. (A.S.C.P.), Rochester Institute of Technology, 1957

Sandra J. Schlafke, B.A., Rice University, 1959; M.A., 1962.

Patrick M. Wood, A.B., Centre College at Kentucky, 1961; M.S., Purdue University, 1965; Ph.D., 1968.

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 films are used to complement the current dissections; cineradiographs are presented regularly.

Fresh organs are provided for demonstration and dissection at appropriate times. Occasional attendance at autopsies is recommended. Frequent discussions are held with small groups of students.

504. *Neural Sciences.* This course, which is taught conjointly by the Departments of Anatomy and Physiology and Biophysics, provides a broad introduction to modern neurobiology. The neuroanatomical aspects of the course deal primarily with the tissues of the central nervous system from an experimental point of view. The course occupies two and one-half days a week for the first seven weeks of the second semester.

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 rent a microscope from the School or have his own.

Elective Courses

Morphological Basis of Cell Biology. A seminar course dealing each year with a different topic. (Staff)

Recent Studies of Mammalian Development. This seminar course deals with a number of topics in early mammalian development, including capacitation of spermatozoa; sperm transport; penetration of the ovum; interspecies crosses; cleavage; tubal transport of the ovum; metabolism of the egg and blastocyst; in vitro culture of embryos; the intrauterine environment; attachment of the blastocyst; mechanisms of penetration of the endometrium; maintenance of the conceptus; differentiation of

the embryonic cell mass; host-fetus immunological relationships. The emphasis is largely morphological, but includes a good deal of the relevant physiological and biochemical material. (Dr. Enders)

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

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)

Experimental Neuroanatomy. This course is designed as an extension of the neuroanatomy portion of the neural sciences course and deals with selected topics of current interest in neuroanatomy. (Drs. Cowan, Cohen)

Advanced Dissection. Different regions of the body are dissected in detail. A period of six weeks should be allowed for each region: head and neck, thorax, abdomen, superior limb, inferior limb. (Dr. Peterson)

Research. Properly qualified individuals are encouraged to carry on research in the anatomical sciences with the guidance of the departmental staff.

Note—The number preceding the course title 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.

Department of Anesthesiology



According to the American Board of Anesthesiology, this specialty may be described as a practice of medicine which encompasses: (1) the management of procedures for rendering a patient insensible to pain during surgical procedures; (2) the support of life functions under the stress of anesthetic and surgical manipulations; (3) the clinical management of the patient, unconscious from whatever cause; (4) the management of problems in pain relief; (5) the management of problems in cardiac and respiratory resuscitation; (6) the application of specific methods of inhalational therapy; and (7) the clinical management

of various fluid, electrolyte, and metabolic disturbances.

With such objectives in mind, this Department is dedicated to presenting to the student, as opportunities develop: (1) clinical applications of certain anatomic relationships, e.g., regional nerve blocks; (2) applications of principles of respiratory physiology, e.g., mechanics of ventilation under various circumstances, cardiorespiratory resuscitation; (3) application of pharmacologic knowledge related to sedative, narcotic and anesthetic drugs, and to compounds affecting the autonomic nervous system;

(4) clinical problems related to acid-base, fluid, and electrolyte balance in surgical patients; and (5) principles underlying the approaches to the emerging concept of "acute medicine."

Henry E. Mallinckrodt Professor of Anesthesiology and Head of the Department

C. Ronald Stephen, B.Sc., McGill University, 1938; M.D., C.M., 1940.

Research Professor

Albert Roos, M.D., University of Groningen (Holland), 1940. (See Department of Physiology and Biophysics)

Associate Professor

Robert N. Miller, B.A., University of Missouri, 1957; M.D., 1961. (See Department of Pharmacology)

Assistant Professors

Bela I. Hatfalvi, M.D., M.Kir.Tisza Istvan Tudományegyetem (Hungary), 1938.

Lewis J. Thomas, Jr., B.S., Haverford College, 1953; M.D., Washington University, 1957.

Robert W. Vaughan, B.S., Southern Methodist University, 1962; M.D., University of Texas (Southwestern) Medical School, 1966.

Glenn R. Weygandt, M.D., Washington University, 1947.

Assistant Professor (Clinical)

Donald J. Dickler, B.A., New York University, 1942; M.D., 1945.

Instructors

Hugh F. S. Keister, A.B., Washington University, 1955; M.D., 1959.

Ercument Kopman, M.D., Istanbul University, 1947.

Instructors (Clinical)

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

Charles R. Blackwell, M.D., Meharry Medical College, 1965.

Francis G. Duffy, M.D., B. Ch., B.A.O., University College of Dublin, 1951.

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

Robert B. Holloway, B.S., Le Moyne College, 1952; M.D., Meharry Medical College, 1956.

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

Daniel W. Platt, M.D., Chicago Medical College, 1949.

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

Irvin C. Susman, M.D., University of Illinois, 1949.

Between the second and third years of medical school, preceptorships in anesthesiology are available for eight-week periods by individual application. Each preceptee is assigned to a staff anesthesiologist and gains experience in the performance of clinical anesthesia, participates in conferences and seminars, and joins in ward rounds in the recovery room and intensive care unit.

An elective in clinical anesthesiology is offered every six weeks for two students. The pharmacology of inhalation, intravenous, and local anesthetic drugs is demonstrated by practical application by the student in the operating room. The importance of blood gas determinations in evaluating the efficacy of ventilation is shown.

Opportunities to develop proficiency in techniques such as endotracheal intubation are available. Special sessions on cardiopulmonary resuscitation are conducted and students are expected to attend the regular anesthesia conferences and seminars.

Department of Biological Chemistry



The Department offers a general introductory course, an advanced course relating the subject to biology and medicine, and several specialized courses in the major aspects of biochemistry. Students of medicine and in the Graduate School of Arts and Sciences may enroll in the above courses or pursue research work under the direction of the staff. Facilities in research are provided in carbohydrate, lipid, nucleic acid, protein, and steroid biochemistry, with with varying emphasis on enzymology, metabolism, physical chemistry, structural studies, or biochemical genetics. Some summer research fellowships are offered to students of medicine.

Professor and Head of Department

P. Roy Vagelos, A.B., University of Pennsylvania, 1950; M.D., Columbia University, 1954.

Distinguished Service Professor Emeritus

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

Professors

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

George R. Drysdale, B.S., Birmingham-Southern College, 1948; M.S., University of Wisconsin, 1950; Ph.D., 1952.

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.

James C. Warren, A.B., University of Wichita, 1950; M.D., University of Kansas, 1954; Ph.D., University of Nebraska, 1961. (See Department of Obstetrics and Gynecology)

Associate Professors

Leonard J. Banaszak, B.S., University of Wisconsin, 1955; M.S., Loyola University, 1960; Ph.D., 1961. (See Department of Physiology and Biophysics)

Robert E. Thach, A.B., Princeton University, 1961; Ph.D., Harvard University, 1964.

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

Ralph Bradshaw, B.A., Colby College, 1962; Ph.D., Duke University, 1966.

William F. Holmes, A.B., Princeton University 1953; Ph.D., University of Pennsylvania, 1960. (See Biomedical Computer Laboratory)

Craig Merton Jackson, B.S., Washington State University, 1963; Ph.D., University of Washington, 1967.

John J. Jeffrey, B.S., College of the Holy Cross, 1958; Ph.D., Georgetown University, 1965. (See Department of Medicine)

Stuart A. Kornfeld, A.B., Dartmouth College, 1958; Ph.D., Washington University, 1962. (See Department of Medicine)

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)

Blake W. Moore, B.S., University of Akron, 1948; Ph.D., Northwestern University, 1952.

Robert G. Roeder, M.S., University of Illinois, 1965; Ph.D., University of Washington, 1969.

William R. Sherman, A.B., Columbia University, 1951; Ph.D., University of Illinois, 1955. (See Department of Psychiatry)

David F. Silbert, A.B., Harvard University, 1958; M.D., 1962.

Assistant Professor Emeritus

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

Research Assistant Professor

Alfred W. Alberts, B.S., Brooklyn College, 1953.

Instructors

William H. Holland, A.B., Washington University, 1950. (See Department of Psychiatry)

Walter Louis Nulty, B.A., Southern Illinois University, 1956.

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 for students without sufficient background in biochemistry. First semester, 216 hours. Graduate student credit, 10 units; lectures only, 4 units.

504. Advanced Biological Chemistry. Lectures for students with appropriate back-

ground in biological chemistry. Special emphasis on the subject as it relates to important aspects of biology and medicine. First semester. Credit 4 units.

Elective Courses

505. *Proteins and Enzymes.* Discussion of the chemistry of amino acids, peptides, and proteins, with emphasis on those aspects contributing to their three-dimensional structure. Development of enzyme kinetic theory, including current concepts of regulatory enzymes. Specific enzymes and classes of enzymes are discussed with respect to the correlation of their kinetic and molecular properties and the overall chemical mechanism of the catalytic reaction. Four class hours a week. Credit 4 units.

506. *Selected Topics in Intermediary Metabolism.* The regulation of metabolic pathways, protein-protein interactions, the biosynthesis and interconversions of various carbohydrates and lipids. Two class hours a week. Credit 2 units.

508. *Membrane Chemistry, Structure and Function.* Chemistry and physical chemistry of membrane components. Membrane structure as related to cell permeability, active transport, and synthesis of the bacterial cell wall. Three class hours a week. Credit 3 units.

511. *Nucleic Acids and the Biosynthesis of Proteins.* Mechanism of the biosynthesis of nucleic acids and proteins is emphasized. Specialized aspects in higher organisms are considered. Credit 3 units.

512. *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. Calculus is desirable. Three

class hours and one laboratory period a week. Credit 4 units. (Dr. Holmes)

515. *Research opportunities* are offered in the following general areas of biochemistry: Biochemical studies in lipid metabolism. (Dr. Vagelos)

X-ray analysis of enzyme structure. (Dr. Banaszak)

Problems in protein chemistry. (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. Kinetic theory and applications to enzyme reactions. (Dr. Frieden)

Biosynthesis of cell wall structures and mechanism of sugar transformations in microorganisms. (Dr. Glaser)

Biochemical studies of protein-lipid interactions; mechanism of blood clotting. (Dr. Jackson)

Nucleic acid biochemistry of eucaryotes in relation to development and differentiation. (Dr. Roeder)

Investigation of fatty acid metabolism and membrane biochemistry through techniques of biochemical genetics. (Dr. Silbert)

Mechanism of protein synthesis. (Dr. Thach)

Computer methods in biochemistry. (Dr. Holmes)

Biochemistry of collagen. (Dr. Jeffrey)

Research on the structure, function, and biosynthesis of complex oligosaccharides present on mammalian cell surfaces and in serum glycoproteins.

(Dr. Kornfeld)

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)

Studies of proteins specific to the nervous system; their localization, physical and chemical properties. (Dr. B. Moore)

Search for small molecules unique to the nervous system; carbohydrate metabolism; mass spectrometry computer techniques. (Dr. Sherman)

Sex steroid metabolism. (Dr. Warren)

Biochemical transformations of steroid hormones. (Dr. Wiest)

523-524. *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 acid and nitrogen metabolism, (3) proteins, (4) lipids, (5) coenzymes (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 number preceding the course 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.

The John Milliken Department of Medicine



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. B. Parker

Dermatology
Dr. A. Eisen

Endocrinology and Metabolism
Dr. Daughaday, Dr. Kipnis

Gastroenterology
Dr. Alpers, Dr. Aach

Hematology
Dr. E. B. Brown, Jr.

Hypertension
Dr. H. M. Perry

Immunology
Dr. C. Parker

Infectious Diseases
Dr. Harford

Malignant Disease
Dr. Reinhard

Medical Genetics
Dr. Sly

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 semester of the second year and continues throughout the third and fourth years of the curriculum. Teaching in 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.

A junior clerkship of twelve weeks, divided into two six-week periods, is served on the nursing divisions of the Barnes Hospital Private Medical Service, the Max C. Starkloff Hospital, the Jewish Hospital of St. Louis, or the St. Louis Veterans Administration Hospital. Senior students may elect to take a six-week clerkship on the Barnes Hospital Ward Medical Service or at 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*

Carl V. Moore, A.B., Washington University, 1928; M.D., 1932; LL.D. (hon.), Elmhurst College, 1955.

*Sydney M. and Stella H. Schoenberg
Professor*

Louis V. Avioli, B.A., Princeton University, 1953; M.D., Yale University, 1957. (Jewish Hospital)

John E. and Adaline Simon Professor

Stanford Wessler, B.A., Harvard University, 1938; M.D., New York University, 1942. (Jewish Hospital)

Professors

Neal S. Bricker, A.B., University of Colorado, 1945; M.D., 1949.

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

Hugh Chaplin, Jr., A.B., Princeton University, 1943; 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.

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

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 Division of Gerontology)

Philip W. Majerus, M.D., Washington University, 1961. (See Department of Biological Chemistry)

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

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

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)

John Russell Smith, A.B., University of Wisconsin, 1931; A.M., 1932; M.D., Washington University, 1934.

Professor (Clinical)

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

Professors Emeriti (Clinical)

Aldred Goldman, A.B., Washington University, 1916; M.D., 1920; M.S., 1922.

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

Associate Professors

David Hershel Alpers, B.A., Harvard College, 1956; M.D., 1960.

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

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

Leonard Jarett (Laboratory Medicine), B.A., Rice University, 1958; M.D., Washington University, 1962. (See Department of Pathology) (Director of Diagnostic Laboratories, Barnes Hospital)

Saulo Klahr (Established Investigator of the American Heart Association), 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.

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)

G. Charles Oliver, A.B., Harvard University, 1953; M.D., 1957. (Jewish Hospital)

C. Kirk Osterland, M.D., University of Manitoba, 1956. (See Department of Preventive Medicine and Public Health)

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

Horace Mitchell Perry, M.D., Washington University, 1946. (Chief, Washington University Medical Service, St. Louis V.A. Hospital)

John A. Pierce, M.D., University of Arkansas, 1948. (St. Louis V.A. Hospital)

Eduardo Slatopolsky, M.D., University of Buenos Aires, 1959.

William S. Sly, M.D., St. Louis University, 1957. (Faculty Associate, American Cancer Society) (See Department of Pediatrics)

John D. Vavra, B.A., University of Colorado, 1950; M.D., Washington University, 1954. (See Department of Preventive Medicine and Public Health) (Chief, Washington University Medical Service, Starkloff Hospital)

Mario Werner (Laboratory Medicine), M.D., Swiss Federal Institute of Technology (Zurich), 1956. (See Department of Pathology)

R. Dean Wochner, A.B., Arizona State College, 1956; M.D., Washington University, 1960. (Acting Hospital Commissioner of St. Louis and Acting Director of Health and Hospitals)

Associate Professors (Clinical)

Bernard T. Garfinkel, M.D., Washington University, 1948. (See Division of Health Care Research)

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.

Joseph W. Noah, A.B., University of Missouri, 1938; B.S. in Medicine, 1939; M.D., Washington University, 1941.

Robert Paine, M.D., Harvard University, 1944. (St. Luke's Hospital)

Associate Professors Emeriti (Clinical)

Joseph W. Larimore, A.B., DePauw University, 1908; M.D., Washington University, 1913.

William H. Olmsted, B.S., Coe College, 1909; M.D., Johns Hopkins University, 1913.

Research Associate Professors

Norma A. Fletcher, M.S., The Technical University, Copenhagen, 1949; Ph.D., University of Copenhagen, 1965.

Rosalind H. Kornfeld, B.S., George Washington University, 1957; Ph.D., Washington University, 1961.

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

Assistant Professors

Richard D. Aach, A.B., Washington University 1955, M.D., 1959.

Umit T. Aker, M.D., Istanbul University, 1954.

Om P. Bahl, M.B.B.S., Punjab University, 1957; M.R.C.P., University of Edinburgh, 1960.

C. Elliott Bell, Jr. (Laboratory Medicine), B.S., Tulane University, 1960; M.D., 1964. (See Department of Pathology)

Clifford A. Birge, A.B., Amherst College, 1956; M.D., Washington University, 1961. (Starkloff Hospital)

Stanley Julius Birge, Jr., B.A., Amherst College, 1959; M.D., Washington University, 1963. (Jewish Hospital)

- Jacques J. Bourgoignie, M.D., Université Catholique de Louvain (Belgium), 1958.
- Richard B. Byrd, M.D., St. Louis University, 1954; M.S.Med., University of Minnesota, 1960.
- Lewis Robert Chase (Howard Hughes Medical Institute Investigator), A.B., Princeton University, 1960; M.D., Harvard University, 1964.
- Malcolm T. Foster, Jr., B.S., Wake Forest College, 1959; M.D., 1963. (Starkloff Hospital)
- Rodolfo T. Guillen, M.D., Institute of Medicine, Far Eastern University, 1957. (St. Louis V.A. Hospital)
- John G. Haddad, Jr., B.A., Tulane University, 1958; M.D., 1962. (Jewish Hospital)
- Duane C. Hellam, B.A., Arizona State College, 1955; M.D., Washington University, 1959. (See Department of Physiology and Biophysics)
- 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., Oxford University, 1957; M.D., Harvard University, 1960. (See Department of Physiology and Biophysics) (Jewish Hospital)
- Harold Seymore Kaplan (Laboratory Medicine), A.B., Oberlin College, 1958; M.D., Albert Einstein College of Medicine, 1962. (See Department of Pathology)
- Robert L. Kaufman, A.B., Washington University, 1959; M.D., 1963. (See Department of Pediatrics)
- Robert E. Kleiger, B.A., Yale University, 1956; M.D., Harvard Medical School, 1960. (Jewish Hospital)
- J. Joseph Marr, B.S., Xavier University, 1959; M.D., Johns Hopkins University, 1964; M.S., St. Louis University, 1968. (Starkloff Hospital)
- Gerald Medoff, A.B., Columbia College, 1958; M.D., Washington University, 1962.
- Anthony S. Pagliara, B.S., Union College, 1960; M.D., Albany Medical College, 1965. (Howard Hughes Medical Institute Investigator) (See Department of Pediatrics)
- Alan M. Robson, M.B.B.S., University of Durham Medical School (England), 1959; M.D., 1964. (See Department of Pediatrics)
- Shabbir Haider Safdar, F.Sc., Government College Jhang, 1954; M.D., Nishtar Medical College (Multan, Pakistan), 1961. (St. Louis V.A. Hospital)
- Robert M. Senior, A.B., Oberlin College, 1957; M.D., George Washington University, 1961. (Jewish Hospital)
- Laurence A. Sherman, B.A., B.S., University of Chicago, 1956; M.D., Albany Medical College, 1964. (Jewish Hospital)
- Jay Wesley Smith (Immunology), A.B., Columbia University 1958; M.D., Washington University, 1962.
- Isaias Spilberg, B.S., University of San Marcos (Lima, Peru), 1956; M.D., 1963. (See Department of Preventive Medicine and Public Health) (Starkloff Hospital)
- Gerald A. Wolff, A.B., Harvard College, 1955; M.D., Washington University, 1961.
- Assistant Professors (Clinical)*
- Morris Alex, B.S., University of Missouri, 1942; M.D., Washington University, 1943. (See Division of Health Care Research)
- France Alexander, A.B., Indiana University, 1950; M.D., 1953. (Director, Medical Service, Homer G. Phillips Hospital)
- 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.
- Morton A. Binder, B.S., Yale University, 1948; M.D., Columbia University, 1951.
- Benjamin A. Borowsky, M.D., Washington University, 1958.
- Francis Joseph Catanzaro, M.D., Washington University, 1948.
- Adolph H. Conrad, Jr. (Dermatology), A.B., Washington University, 1934; M.D., 1938.
- Joseph C. Edwards, A.B., University of Oklahoma, 1930; M.D., Harvard University, 1934.
- I. J. F lance, A.B., Washington University, 1931; M.D., 1935.
- 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.
- William Kearney Hall (Dermatology), B.S., Yale University, 1939; M.D., Harvard University, 1942.
- Lawrence K. Halpern (Dermatology), M.D., University of Colorado, 1937.
- David T. Hammond, A.B., Indiana University, 1957; M.D., Washington University, 1960.
- 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.

Sidney Jick, M.D., Washington University, 1949.

Robert S. Karsh, A.B., Washington University, 1951; M.D., 1952.

Robert W. Kelley, A.B., Southwestern College, 1932; M.D., Washington University, 1936.

Charles Kilo, M.D., Washington University, 1953; M.D., 1959.

Robert C. Kingsland, A.B., Washington University, 1933; M.D., 1937.

Norman P. Knowlton, Jr., B.S., Harvard University, 1942; M.D., 1945.

Marvin E. Levin, A.B., Washington University, 1947; M.D., 1951.

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

Morris D. Marcus (Dermatology), M.D., Washington University, 1934.

Robert S. Mendelsohn, B.A., Washington and Lee University, 1950; M.D., Washington University, 1954. (See Division of Health Care Research)

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.

Charles C. Norland, B.S., Washington State University, 1955; M.D., Washington University, 1959.

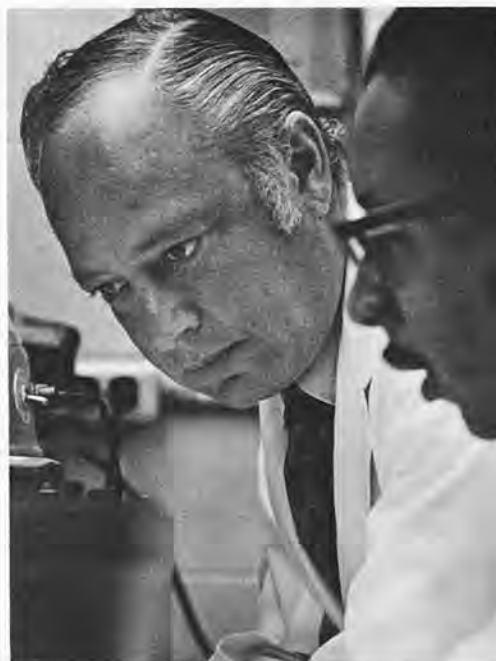
James C. Peden, Jr., A.B., Haverford College, 1951; M.D., Washington University, 1955. (See Department of Preventive Medicine and Public Health)

William David Perry, A.B., Northwest Missouri State College, 1943; B.S. in Medicine, University of Missouri, 1945; M.D., Washington University, 1947.

William J. Phillips, B.A., Oklahoma State University, 1959; M.D., Washington University, 1963.

Kenneth C. Price, M.D., University of Washington, 1951.

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.

Harold Scheff, M.D., University of Toronto, 1931.

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.

Stanley M. Wald, M.D., Washington University, 1946.

Alvin S. Weneker, A.B., Washington University, 1949; M.D., 1953.

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.

Herbert B. Zimmerman, M.D., Washington University, 1951.



Assistant Professors Emeriti (Clinical)

Charles W. Duden, M.D., Washington University, 1926.

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.

Research Assistant Professors

Michiyasu Awai, B.S., Osaka College of Technology, 1948; M.D., Okayama University, 1953; Ph.D., 1959.

John James Jeffrey, Jr. (Dermatology), B.S., College of the Holy Cross, 1958; Ph.D., Georgetown University, 1965. (See Department of Biological Chemistry)

Irene E. Karl, B.S., University of Wisconsin, 1937; M.D., 1938; Ph.D., 1940. (See Department of Pathology)

Mabel L. Purkerson, A.B., Erskine College, 1951; M.D., Medical College of South Carolina, 1956. (See Department of Pediatrics) (On leave of absence)

Doris Rolf, A.B., Harris Teachers College, 1936.

Ee Thye Yin, Inter.B.Sc., University of London, 1954. (Jewish Hospital)

Research Assistant Professor Emeritus

Anna Reubenia Dubach, A.B., Bryn Mawr College, 1919; M.S., University of Colorado, 1935; Ph.D., 1938.

Instructors

Joseph Avruch, B.S., Brooklyn College, 1961; M.D., Washington University, 1965. (Chief Resident, Medical Service, Barnes Hospital)

Eugene A. Bauer, B.S., Northwestern University, 1963; M.D., 1967. (Trainee NIAMD, Dermatology)

Joseph G. Caldwell, B.A., Ohio State University, 1961; M.D., 1964. (Jewish Hospital)

Greta Camel, A.B., University of Wisconsin, 1946; M.D., 1949. (St. Louis V.A. Hospital)

Philip E. Cryer, B.A., Northwestern University, 1961; M.D., 1965. (Chief Resident, Medical Service, Barnes Hospital)

John T. Garland, B.A., Cornell University, 1961; M.D., Johns Hopkins University, 1965. (Trainee NIAMD, Metabolism)

Gerald C. Goldman, A.B., Harvard College, 1966; M.D., Boston University, 1966.

Bevra H. Hahn, B.Sc., Ohio State University, 1960; M.D., Johns Hopkins University, 1964. (See Department of Preventive Medicine)

- Theodore J. Hahn, Jr., A.B., Princeton University, 1960; M.D., Johns Hopkins University, 1964. (Jewish Hospital)
- Joseph Lee Kinzie, Jr., B.A., Bridgewater College, 1959; M.D., University of Virginia, 1963. (Trainee NIAMD, Gastroenterology)
- Gerald G. Morris, A.B., George Washington University, 1961; M.D., 1965. (See Department of Preventive Medicine and Public Health)
- Reginald P. Pugh, B.A., University of Michigan, 1953; M.D., 1955. (Ellis Fischel State Cancer Hospital)
- Daniel Rosenblum, B.S., University of Chicago, 1962; M.D., 1966. (Jewish Hospital)
- Robert W. Schmidt, A.B., University of California, 1961; M.D., Stanford University, 1966. (Trainee NIAMD, Renal Disease)
- Caroline C. Waddell, B.S., Louisiana State University, 1962; M.D., 1965. (St. Louis V.A. Hospital)
- Louis Clyde Waddell, Jr., B.S., Tulane University, 1961; M.D., 1964. (Pulmonary Center, Scott Air Force Base)
- Herbert Weber, M.D., Hebrew University and Hadassah Medical School, 1964. (National Kidney Foundation Fellow in Medicine, Renal Diseases)
- Instructors (Clinical)*
- Charles C. Abel, A.B., Westminster College, 1952; M.D., Washington University, 1956.
- Oliver Abel III, Westminster College, 1951; M.D., Washington University, 1955.
- Harry Agress, B.S., Washington University, 1932; M.D., 1932.
- James W. Bagby (Dermatology), A.B., University of Missouri, 1930; B.S. Med., 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.
- Aaron Birenbaum, M.D., Washington University, 1948.
- Benje Boonshaft, A.B., Washington University, 1957; M.D., 1961.
- Dee C. Boswell, B.S., University of Illinois, 1959; M.D., 1963.
- 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.
- Benjamin H. Charles, M.B., Ch.B., University of Edinburgh, 1934.
- Margaret Chieffi, M.D., University of New Zealand, 1937.
- Philip Comens, B.S. in Medicine, University of Missouri, 1949; M.D., Washington University, 1951.
- Ralph Copp, 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. (On leave of absence)
- 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.
- Donald H. Finger, 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.
- Arnold M. Goldman, A.B., Harvard University, 1955; M.D., Washington University, 1959. (See Division of Health Care Research)
- John M. Grant, A.B., Princeton University, 1950; M.D., Washington University, 1954.
- Axel R. Gronau, M.D., University of Naples, 1935.
- Mark J. Halloran, M.D., Marquette University, 1959.
- Lee W. Hawkins, A.B., Haverford College, 1948; M.D., Washington University, 1952.
- James Neil Heins, A.B., University of Louisville, 1957; M.D., 1961.
- John L. Horner, A.B., Washington University, 1932; M.D., 1936.
- 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.

- Harold J. Joseph, B.A., University of Texas, 1947; M.D., 1950.
- William G. Juergens, M.D., Washington University, 1961.
- David N. Kerr, A.B., University of Colorado, 1936; M.D., Washington University, 1941.
- 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.
- Joseph Levitt, M.D., Washington University, 1949.
- Morton Allan Levy, B.A., University of California at Los Angeles, 1957; M.D., Washington University, 1961.
- David M. Lieberman, M.D., Vanderbilt University, 1949.
- Warren M. Lonergan, A.B., Westminster College, 1936; M.D., Vanderbilt University, 1940.
- Carl A. Lyss, A.B., Washington University, 1952; B.S., 1952; M.D., 1956.
- William E. Magee, M.D., Duke University, 1950.
- 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.
- Edward J. Miller, B.A., St. John's University, 1958; M.D., St. Louis University, 1962. (See Department of Preventive Medicine and Public Health)
- Austin F. Montgomery, M.D., University of Pittsburgh, 1954.
- Arlen E. Morrison, A.B., Washington University, 1954; M.D., 1958.
- Frede Mortensen, B.A., Wagner College, 1949; M.D., New York Medical College, 1953.
- Leonard N. Newmark, A.B., Washington University, 1956; M.A., 1959; M.D., 1963.
- Gordon Newton, M.D., University of Arkansas, 1958.
- Lamar H. Ochs, A.B., Washington University, 1941; M.D., 1944.
- M. 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.
- Robert C. Packman, A.B., Washington University, 1953; B.S. in Med., University of Missouri, 1954; M.D., Washington University, 1956.
- Vincent J. Proskey, B.S., University of Detroit, 1954; M.D., Marquette University, 1964.
- 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 Spalding 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.
- James W. Walsh, A.B., Washington University, 1950; M.D., 1954.
- Hugh R. Waters, B.S., Northwestern University, 1942; M.D., Washington University, 1945.
- Herbert C. Wiegand, A.B., Washington University, 1940; M.D., 1943.
- Charles A. Winterling, B.A., Oberlin College, 1954; M.D., University of Rochester, 1958.
- Edward M. Wolfe (Dermatology), B.A., Hobart College, 1956; M.D., Washington University, 1960.



James A. Wood, A.B., Westminster College, 1947; M.D., Washington University, 1949.

Instructors Emeriti (Clinical)

Louis F. Aitken, B.S., University of Illinois, 1923; M.D., Washington University, 1927.

Martin F. Engman, Jr. (Dermatology), M.D., Washington University, 1928.

Bertrand Y. Glassberg, B.S., Washington University, 1923; M.D., 1925.

Lee B. Harrison, A.B., University of Utah, 1925; M.D., Washington University, 1927.

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 Instructors

Teofil Kheim (Gerontology), M.D., University of Budapest, 1934. (See Division of Gerontology)

Ida K. Mariz (Veterinary Medicine), A.B. Washington University, 1940.

James William Mills, B.S.A., University of Missouri, 1964; D.V.M., 1967.

Sister Ann Marie Skinner, A.B., Harris Teachers College, 1931; M.A., St. Louis University, 1936.

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.

Research Assistants

Sharon E. Carmody, B.A., Webster College, 1960. (St. Louis V.A. Hospital)

Margaret Williams Erlanger, B.A., University of Iowa, 1932; M.S., 1938. (St. Louis V.A. Hospital)

Walter T. Gregory, B.S., St. Louis University, 1960.

Kuo H. Hwang, M.D., National Chekiang University, 1954.

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)

Mary E. Lottes, B.A., Marillac College, 1962.

Odessa Owens

Betty F. Perry, A.B., Washington University, 1945. (St. Louis V.A. Hospital)

James E. Purifoy, Jr., B.S., Washington University, 1969. (St. Louis V.A. Hospital)

Elaine V. Rieders, B.A., Hunter College, 1948.

John Woodring Studt, A.B., Yale University, 1957.

Doris Thompson, B.S., Mississippi State University, 1942.

Jessie T. Yates, B.S., Fiske University, 1956.

Teaching by the Department of Medicine in the second year is designed to (a) prepare the student for the transition from the pre-clinical 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 are used constantly with the beginning of junior clerkships. This instruction is at times undertaken jointly with members of other clinical departments, and is coordinated when practicable with subject matter presented by the Department of Pathology.

FIRST YEAR

Human Genetics. This course, which is taught by the Division of Medical Genetics and the Departments of Pediatrics and of Medicine, is divided into three parts: cytogenetics, biochemical genetics, and population genetics. Each section consists of ten to twelve formal lectures in one of these three areas, followed by a clinical correlation session presenting a series of patients who illustrate the genetic principles covered in the lectures. A serious attempt is made to correlate the studies in biochemistry, microbiology, and biostatistics with problems relevant to clinical medicine.

Topics in Clinical Medicine. This interdepartmental course is 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 involves 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. Daughaday, R. Little, Goldring, Eliasson)

(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. Brown, Jr., and Staff)

THIRD YEAR

General Medicine. Supervised study of patients on the semi-private medical service of Barnes Hospital and Jewish Hospital, and on the wards of Starkloff Hospital and St. Louis 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, Wessler, Perkoff, M. Perry, Vavra, 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 Conference*. Abstracts of the clinical records of patients upon whom postmortem 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, Dr. Kissane and 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 five 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 clinical/pathological conferences.

(Drs. C. Moore, Daughaday, and Staff)

General Medicine and Subspecialty Clinics. Six weeks, all day. Designed to give the students an opportunity to work up and follow in the general medicine clinic patients for whom they have primary responsibility under supervision of the part-time and full-time staff. Subspecialty clinic participation is included in the clerkship and is integrated with specialty rounds held in conjunction with the clinic. Subspecialty clinics include dermatology, arthritis, renal, GI, metabolism and hematology. May be elected once for six weeks or twice for twelve weeks, which would provide better opportunity for follow-up of patients.

(Dr. Vavra and Staff)

Cardiovascular Disease

(a) *Electrocardiography*, elementary vectorcardiography. Lectures and practical

demonstrations designed to provide a solid base of electrocardiographic knowledge.

(Drs. Parker, Bahl, Hellam, Wolff)

(b) Clinical Cardiology, St. Luke's Hospital, six weeks, all day. Students are 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) 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. Pulmonary vasomotion and the physiology of pulmonary embolism.

(Dr. B. Parker)

4. Biochemistry and measurement of cardiac glycosides; computer application to cardiology.

(Dr. Oliver)

5. Experimental thrombosis.

(Dr. Wessler)

6. Pathogenic mechanisms of hypertension.

(Dr. Perry)

Dermatology

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

(Dr. A. Eisen and Staff)

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

1. Connective tissue, macromolecular organization, degradation, and related problems.

(Dr. A. 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 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 Starkloff Hospital and St. Luke's Hospital. Students are assigned responsibilities similar to those of an intern and participate in all teaching conferences.

(Drs. Vavra, 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,
Dr. Kissane and Pathology Staff)

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

Gastroenterology

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

(Drs. Alpers, Aach)

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

(Drs. Alpers, Aach)

Genetics

(a) Medical Genetics. Twelve weeks, all day. Combined clinical and research course.

(Drs. Sly, Kaufman)

(b) Experience in clinical or laboratory investigative approach to the study of genetic problems.

(Drs. Sly, Kaufman)

Hematology

(a) Clinical hematology. Six weeks, all day. Students receive intensive instruction in morphology, specialized diagnostic technics,

management of patients with hematologic disorders. Two separate clerkships are offered.

(Drs. E. Brown, Jr.,
Reinhard, Kornfeld, Majerus)

(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. Sherman)

(c) Hemostasis, thrombosis, blood coagulation, and fibrinolysis. Series of twelve weekly seminars.

(Dr. Fletcher)

(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)

Immunology

(a) Clinical immunology. Series of 24 lectures and seminars on immunologic mechanisms in disease.

(Dr. C. Parker)

(b) Research. Minimum 12 weeks, all day.

1. Research in clinical or basic immunology (cellular immunity, immunologic deficiency diseases, antigen processing by macrophages).

(Dr. C. Parker)

2. Antibody structure, antibody biosynthesis, and antibody binding reactions.

(Dr. Little)

3. Plasma protein metabolism, particularly as related to the immune system.

(Dr. Wochner)

Infectious Disease

(a) Clinical infectious disease and bacteriology. Jewish Hospital, six weeks, all day.

(Drs. Little, Sonnenwirth)

(b) Clinical infectious diseases. Barnes Hospital, six weeks, all day.

(Drs. Harford, Medoff)

Metabolism and Endocrinology

(a) Seminar: Endocrine physiology and the biochemical aspects of hormone action. Twelve weeks. Offered once a year.

(Drs. Daughaday, Kipnis, Avioli, Chase)

(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; growth hormone, prolactin. (Dr. Daughaday)

2. Experimental diabetes, insulin action, intermediary metabolism of fats and carbohydrate. (Dr. Kipnis)

3. Calcium and parathyroid metabolism, vitamin D. (Dr. Avioli)

Pulmonary Disease and Function. Six weeks, all day.

(Dr. Pierce)

Renal Disease

(a) Clinical nephrology. Six weeks, all day. Study of patients with renal disease and electrolyte disorders.

(Drs. Bricker, Klahar,
Slatopolsky, Lubowitz)

(b) Mixed clinical and research elective in renal disorders and transport. Eighteen weeks, all day. Research activities can be selected in general renal pathophysiology, micropuncture techniques, 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)

Ethical Problems in Medicine. Twelve weekly seminars.

(Dr. J. Vavra)

Department of Microbiology



The Department teaches a one-semester introductory course in microbiology for first year medical students and for graduate students. The course is concerned particularly with principles of microbial physiology and genetics, and of immunology, and through a limited survey of pathogenic bacteria, viruses, and fungi attempts to prepare medical students for more advanced study of infectious diseases later in the curriculum. The Department also offers a number of advanced elective courses and opportunities for elective research activities. A limited number of summer research fellowships is available.

Professor and Head of Department

Herman N. Eisen, A.B., New York University, 1939; M.D., 1943.

Professor

Stephen C. Kinsky, A.B., University of Chicago, 1951; Ph.D., Johns Hopkins University, 1957. (See Department of Pharmacology)

Associate Professors

David Apirion, M.S., Hebrew University of Jerusalem, 1960; Ph.D., University of Glasgow, 1963.

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)

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

David Schlessinger, B.A., University of Chicago, 1955; B.S., 1957; Ph.D., Harvard University, 1961.

Alexander C. Sonnenwirth, A.B., University of Nebraska, 1950; M.S., Purdue University, 1953; Ph.D., Washington University, 1960. (See Department of Pathology) (Jewish Hospital)

Associate Professor Emeritus

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

Assistant Professors

Joseph Eigner, A.B., Dartmouth College, 1955; A.M., Harvard University, 1958; Ph.D., 1960.

Julian B. Fleischman, B.S., Yale University, 1955; Ph.D., Harvard University, 1960. (See Department of Preventive Medicine and Public Health)

George Kobayashi, B.S., University of California, 1952; Ph.D., Tulane University, 1963. (See Department of Medicine)

Sondra Schlesinger, B.S., University of Michigan, 1956; Ph.D., 1960.

Ernest S. Simms.

Research Assistant

John Courtney, A.B., University of Illinois, 1953.

FIRST YEAR

531. Microbiology. Lectures and laboratory. This course presents the basic principles relating to the growth and reproduction of bacteria and viruses and to the immune responses of the host to diverse substances, including pathogenic microbes and their metabolic products. The organization of the course is as follows: pure culture methodology; genetics of bacteria and viruses; physiology of growth, with special emphasis on factors controlling expression and replication of genes in bacterial cells and in viruses. The immunology part of the course emphasizes structure, function, and biosynthesis of antibodies, and provides an introduction to cell-mediated immune responses. In terms of the above concepts, specific groups of pathogenic organisms and viruses are then considered. The interaction between host and

parasite is studied by analyzing wherever possible the molecular basis for the pathogenicity of the microbe and for the immune reactions of man. The factors that made microorganisms vulnerable or resistant to chemotherapeutic agents are emphasized.

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 has 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 (all given in alternate years):

592. Molecular Biology of Chromosomes from Procaryotic and Eucaryotic Cells. (Spring, 1972) Emphasis on mammalian cells, bacteriophage, and viruses. Topics to be covered: replication, recombination, and expression of genes. Chromosome structure, special features of mitosis and meiosis. The mitotic apparatus. Interspecies hybridization in tissue culture. Genetic engineering. (Dr. Apirion)

593. Molecular Physiology of Eucaryotic and Procaryotic Cells. (Fall, 1971) Selected features of structure and cell physiology, using as models primarily bacteria and yeast. Comparison and contrast of genetic organization, ribosome formation, permeation mechanisms. (Dr. D. Schlessinger)

594. *Antibodies: Structure, Function, and Biosynthesis*. (Spring, 1970) The immune response in relation to the structure, function, and biosynthesis of antibodies.

(Drs. Eisen, Fleischman, R. Little, Jr.)

595. *Molecular Biology of Bacterial Viruses*. (Spring, 1971) Molecular structure of bacterial viruses. Metabolism of the infected cell, with emphasis on the genetics of host and viral-controlled functions.

(Dr. Kennell)

596. *Microbial Physiology*. (Fall, 1970) Regulation of microbial growth and cell division; control of the biosynthesis of proteins and nucleic acids in microbial cells; differentiation in microbial cells (e.g., spore formation and germination development of bacterial viruses).

(Drs. M. and S. Schlesinger)

Research Electives

590. *Research*. The purpose of these electives is to acquaint the student with the 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)

Membrane structure and immune lysis of cells.

(Dr. Kinsky)

The control of cellular differentiation of the medically important systemic fungi, in particular, *Histoplasma capsulatum*.

(Dr. Kobayashi)

Immunochemical techniques. Biosynthesis of antibodies and their binding reactions.

(Dr. Little)

Comparative studies of alkaline phosphatase from different microorganisms: 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. An introduction to the anatomy and physiology of the nervous system is presented in the first-year course in neural sciences provided by the Departments of Anatomy and Physiology and Biophysics. In the second year the Department is the major contributor to an interdepartmental course in pathophysiology of nervous system disorders. Here the inter-relationships are demonstrated between knowledge derived from basic investigative and from clinical sources. In addition there are lectures and exercises with patients in neurological

physical diagnosis. Third-year activities are based in a full-time 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

William M. Landau, M.D., Washington University, 1947.

Professors

Philip R. Dodge, M.D., University of Rochester, 1948. (See Department of Pediatrics)

Sven G. Eliasson, Ph.D., University of Lund, 1952; M.D., 1954.

James Lee O'Leary, B.S., University of Chicago, 1925; Ph.D., 1928; M.D., 1931. (See Department of Surgery)

Professor Emeritus and Lecturer

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

Associate Professors

Lawrence A. Coben, B.S., Western Reserve University, 1948; M.D., 1954; M.A., Northwestern University, 1951.

George Klinkerfuss, A.B., Washington University, 1952; M.D., 1956.

Arthur L. Prensky, A.B., Cornell University, 1951; M.D., New York University, 1955. (See Department of Pediatrics)

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)

Leonard Berg, A.B., Washington University, 1945; M.D., 1949.

Andrew J. Gay, B.S., University of Alabama, 1950; M.A., 1954; M.D., Medical College of Alabama, 1955. (See Department of Ophthalmology)

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

John E. Brooks, M.B., Ch.B., Victoria University of Manchester, 1958; M.R.C.P., London, 1965.

Robert L. Chesanow, B.S., Union College, 1955; M.D., Albany Medical College, 1960. (Starkloff Hospital)

Darryl C. DeVivo, B.A., Amherst College, 1959; M.D., University of Virginia, 1964. (See Department of Pediatrics)

James A. Ferrendelli, A.B., University of Colorado, 1958; M.D., 1962. (See Department of Pharmacology)

Marvin A. Fishman, B.S., University of Illinois, 1959; M.D., 1961. (See Department of Pediatrics)

William B. Hardin, B.A., Rice University, 1953; M.D., University of Texas, 1957.

Alan L. Pearlman, A.B., State University of Iowa, 1958; M.D., Washington University, 1961. (Gordon R. Coates Scholar in Neurology) (See Department of Physiology and Biophysics)

Joseph J. Volpe, B.A., Bowdoin College, 1960; M.D., Harvard Medical School, 1964. (See Department of Pediatrics)

Warren A. Weinberg, B.A., Vanderbilt University, 1956; M.D., 1959. (See Department of Pediatrics)

Assistant Professors (Clinical)

Herbert E. Rosenbaum, B.S., University of Oregon, 1947; M.D., 1949.

Stuart Weiss, A.B., Washington University, 1950; M.D., 1954.

Assistant Professor Emeritus (Clinical)

Archie D. Carr, B.S., Washington University, 1918; M.D., 1921.

Research Assistant Professor

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

Instructors

Hugo Mejia, B.A., St. Tomas de Aquino, 1955; M.D., National University of Colombia, 1963. (Starkloff Hospital)

Instructors (Clinical)

Joseph M. Dooley, Jr., M.D., St. Louis University, 1958.

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 Assistants

Lloyd N. Simpson. (See Department of Otolaryngology)

Jeanne M. Smith.

SECOND YEAR

Neurological Examination in Clinical Diagnosis (part of course in physical diagnosis). Lectures, demonstrations, and practice examinations of neurological patients.

(Drs. Eliasson, Chesanow, 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. Eliasson, Hardin, 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.

(Drs. Eliasson, Landau, and Staff)

FOURTH YEAR

Electives

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

Clinical Neurology. A six-week elective neurology clerkship is offered at Starkloff Hospital. There the student works as a member of the clinical team and assumes responsibility for patients. Formal teaching conferences are provided in addition to regular teaching rounds.

(Drs. Chesanow, Mejia, Dooley, and Staff)

Staff Conferences. Students are invited to attend the conjoint neurological conference (neuropathology, neuroradiology, medical neurology, pediatric neurology, and neurological surgery) held on Wednesday afternoon at 2:00 p.m. in Clopton Amphitheatre. (On the second Wednesday of the month it is held at Starkloff Hospital.) Neuropathology brain cutting conferences are held in the Pathology Amphitheatre on Monday at 1:00 p.m. and in the Starkloff Hospital autopsy conference room on Thursday at 12:30 p.m.

Department of Obstetrics and Gynecology



Students are given practical instruction in obstetrics and gynecology at St. Louis Maternity Hospital, Barnes Hospital, the Washington University Clinics, and also at Starkloff and Homer Phillips Hospitals. Approximately 6,000 confinements annually are available for teaching obstetrics on the ward services of St. Louis Maternity, Starkloff, Homer Phillips, Jewish and St. Luke's 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.

Instruction in Obstetrics and Gynecology commences with the second semester of the second year and continues through the third and fourth years.

Professor and Head of the Department

James C. Warren, A.B., University of Wichita, 1950; M.D., University of Kansas, 1954; Ph.D., University of Nebraska, 1961. (See Department of Biological Chemistry)

Professors

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. (On leave of absence)
Arpad I. Csapo, M.D., University of Szeged (Hungary), 1941.

Walter G. Wiest, A.B., Brigham Young University, 1948; Ph.D., University of Wisconsin, 1952. (See Department of Biological Chemistry)

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

Professors (Clinical)

A. Norman Arenson, B.S., Texas Christian University, 1924; M.D., Washington University, 1928. (See Department of Radiology)

William H. Masters, B.S., Hamilton College, 1938; M.D., University of Rochester, 1943.

Samuel D. Soule, M.D., Washington University, 1928. (See Division of Health Care Research)

Professors Emeriti (Clinical)

John E. Hobbs, A.B., Southwest Missouri State Teachers College, 1923; M.D., Washington University, 1927.

Melvin A. Roblee, B.S., Washington University, 1923; M.D., 1925.

Grandison D. Royston, M.D., Washington University, 1907.

Associate Professor

Ernest R. Friedrich, M.D., University of Heidelberg, 1954.

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.

Jacques Sauvage, M.D., University of Liege, 1957.

Assistant Professors (Clinical)

William Berman, A.B., Washington University, 1931; M.D., 1935.

Arthur R. Bortnick, M.D., Washington University, 1935.

Robert Burstein, M.D., Washington University, 1948.

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.

John B. Martin, B.A., Amherst College, 1951; M.D., Washington University, 1955.

Laurence E. Maze, M.D., Washington University, 1948. (See Division of Health Care Research)

Seymour Monat, A.B., University of Pennsylvania, 1935; M.D., Long Island College 1939.

Norman K. Muschany, A.B., Westminster College, 1947; M.D., Temple University, 1951.

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. Wissner, 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.

Research Assistant Professor

B. Ramanath Rao, B.S., University of Madras, 1957; M.S., University of Baroda, 1962; Ph.D., University of Utrecht, 1967.

Instructors

Louis Dehner, (See Department of Pathology)

Cesar L. Villeneuve, M.D., University of the Philippines College of Medicine, 1965.

Instructors (Clinical)

Hubert L. Allen, A.B., University of Kansas, 1932; M.D., Tulane University, 1936.

Everett A. Beguin, M.D., University of Wisconsin, 1965. (On leave of absence)

- 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.
- Robert S. Cohen, B.S., Union College, 1958; M.D., State University of New York, 1962.
- Robert Duemler, A.B., Washington University, 1952; M.D., 1956.
- S. Michael Freiman, A.B., Montana State University, 1951; M.D., Washington University, 1955.
- Andrew Galakatos, B.S., St. Louis College of Pharmacy, 1960; M.D., University of Missouri, 1965. (On leave of absence)
- Ira Clyde Gall, B.S., University of Cincinnati, 1948; M.D., 1951.
- Robert S. Goell, A.B., Middlebury College, 1949; A.M., University of Pennsylvania, 1950; M.D., Washington University, 1960.
- Godofredo M. Herzog, B.S., Louisiana State University, 1953; M.D., Washington University, 1957.
- Ming-Shian Kao, M.D., National Taiwan University Medical College, 1961.
- S. Robert Kovac, A.B., Washington University, 1960; M.D., University of Missouri, 1964.
- Justin F. Kraner, M.D., University of Michigan, 1949.
- Paul F. Max, B.S., Washington University, 1932; M.D., 1932.
- Arthur J. Meagher, B.S., Missouri University School of Medicine, 1943; M.D., Washington University, 1944.
- Michael McNalley, A.B., Washington University, 1947; M.D., 1951.
- Theodore Merrims, A.B., Washington University, 1949; M.D., 1954.
- Jerry N. Middleton, B.A., Westminster College, 1959; M.D., Washington University, 1963.
- Samad Momtazee, M.D., Shiraz Medical School (Iran), 1961. (See Division of Health Care Research)
- Frank A. Morrison, B.S., University of Nebraska, 1935; M.D., 1936.
- Nathaniel H. Murdock, B.S., Harvard University, 1958; M.D., Meharry Medical College, 1963.
- Ivan T. Myers, B.A., University of Missouri, 1958; M.D., University of Missouri Medical School, 1963.
- Gerald Newport, A.B., Washington University, 1948; M.D., 1953.
- Joseph D. O'Keefe, A.B., University of Colorado, 1946; M.D., Washington University, 1950.
- 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.
- Jonathan R. Reed, B.A., Fisk University, 1956; M.D., Meharry Medical College, 1965.
- Marvin Rennard, A.B., Washington University, 1947; M.D., 1952; B.S., University of Missouri, 1950; M.S., 1950.
- Alexander M. Roter, A.B., University of Illinois, 1948; M.D., 1951.
- James Sawyer, A.B., Ohio State University, 1949; M.D., 1951.
- Melvin M. Schwartz, A.B., University of Nebraska, 1945; M.D., 1947.
- Arthur A. Smith, M.D., St. Louis University, 1958.
- Robert J. Sokol, B.A., University of Rochester, 1962; M.D., 1966. (On leave of absence)
- Frances H. Stewart, M.D., Washington University, 1927.
- Herman Taute, M.D., Philipps University (Marburg/Lahn, West Germany), 1954.
- Eugene D. Taylor, B.S., Virginia State College, 1948; M.D., Howard University, 1954.
- M. Bryant Thompson, M.D., University of California, 1961.
- Bernice A. Torin, A.B., Washington University, 1937; M.D., 1941.
- Arthur M. Townsend III, B.S., University of Michigan, 1955; M.D., Howard University, 1962.
- Alva C. Trueblood, Jr., A.B., Washington University, 1940; M.D., 1943.
- J. Leslie Walker, M.D., University of Tennessee, 1960.
- Wilfred B. Weisbrod, M.D., University of Toronto, 1947.
- Sol Weisman, A.B., Washington University, 1928; M.D., 1932.
- Parker H. Word, B.S., Virginia State College, 1941; M.D., Howard Medical School, 1944.
- 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 1918.

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 in the 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 the third year are encouraged to attend the Planned Parenthood Clinic for practical instruction in the various methods of family planning.

FOURTH YEAR

Electives

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.

Seminar: Advanced Obstetrics. Students interested in obstetrics are given the opportunity to study the literature pertaining to many of the complications of pregnancy. The various topics assigned are discussed with members of the faculty. The seminar is of especial value to students taking clerkships in obstetrics.

Seminar: Advanced Gynecology. Students interested in gynecology are given the opportunity to study the literature pertaining to the diseases and disorders peculiar to

women, including endocrine disorders and infertility. The assigned topics are discussed in a systematic manner with selected members of the faculty. This seminar is 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)

Research in molecular aspects of endocrinology and population control.
(Dr. Warren)

The following clinical externships are available:

Ob.-Gyn. Clinic, W. U. Clinics
(Dr. Woolf)

Obstetrics, Barnes-Maternity (Dr. Woolf)

Gynecology, Barnes-Maternity
(Dr. Friedrich)

Gynecologic Oncology, Barnes-Maternity
(Dr. Camel)

Gynecologic Pathology, Barnes-Maternity
Obstetrics and Gynecology, Jewish Hospital
(Dr. Rothman)

Obstetrics and Gynecology, St. Luke's Hospital
(Dr. Williams)

Obstetrics and Gynecology, Homer G. Phillips Hospital
(Dr. Monat)

Ob.-Gyn. Clinic, Jefferson-Cass Health Center
(Dr. Smiley)

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 provides excellent foundation for residency training in obstetrics and gynecology.

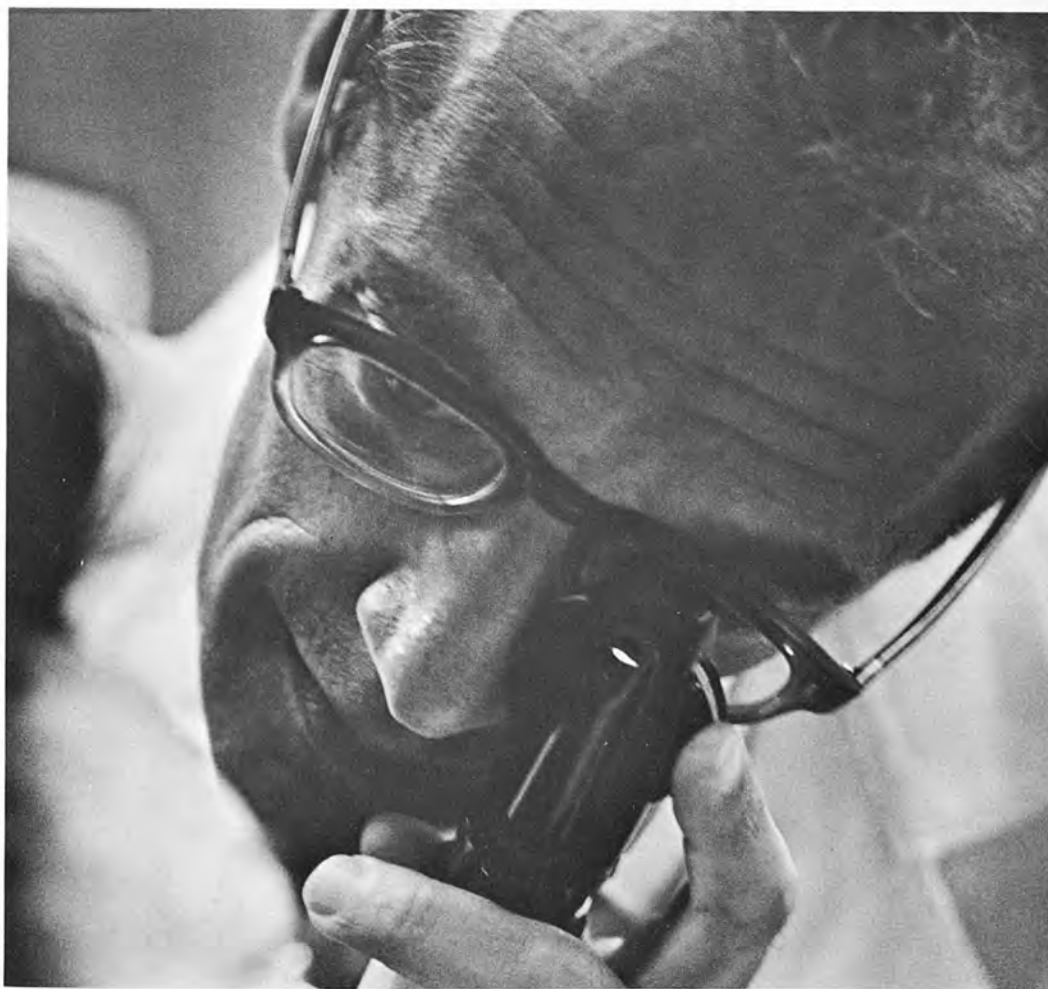
Department of Ophthalmology

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. 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 six-week ophthalmology elective is offered to senior students. This elective affords opportunity for work with patients under supervision.

Professor and Head of the Department

Bernard Becker, A.B., Princeton University, 1941; M.D., Harvard University, 1944.



Professor

James E. Miller, B.S., Tulane University, 1946; M.D., The Medical College of Alabama, 1949. (See Department of Pediatrics)

Research 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. (Also College of Arts and Sciences)

Associate Professors

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

Allan E. Kolker, A.B., Washington University, 1954; M.D., 1957.

Robert A. Moses, A.B., Johns Hopkins University, 1938; M.D., University of Maryland School of Medicine, 1942.

Morton Smith, B.S., University of Maryland, 1956; M.D., 1960. (See Department of Pathology)

Associate Professors (Clinical)

Andrew J. Gay, B.S., University of Alabama, 1950; M.A., 1954; M.D., Medical College of Alabama, 1955. (See Department of Neurology)

Edward Okun, M.D., University of Vermont, 1956.

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.

Howard Rommel Hildreth, M.D., Washington University, 1928.

Frederick Oscar Schwartz, M.D., Washington University, 1910.

Assistant Professors

Edward F. Berg, A.B., Washington University, 1960; M.D., 1964. (On leave of absence)

John F. Bigger, Jr., A.B., Duke University, 1960; M.D., Washington University, 1964.

Ronald Burde, B.S., Massachusetts Institute of Technology, 1960; M.D., Jefferson Medical College, 1964.

Steven M. Podos, A.B., Princeton University, 1958; M.D., Harvard University, 1963.

Assistant Professors (Clinical)

Edmund B. Alvis, M.D., Washington University, 1934.

Stanley Becker, A.B., Washington University, 1948; M.A., 1950; Ph.D., 1951; M.D., Chicago Medical School, 1955.

Daniel Bisno, B.A., University of Wisconsin, 1927; M.D., Johns Hopkins University, 1931.

Isaac Boniuk, B.S., Dalhousie University, 1958; M.D., 1962.

Robert C. Drews, A.B., Washington University, 1952; M.D., 1955.

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.

Jack Kayes, B.A., Yale University, 1953; M.D., Washington University, 1957.

William H. Meinberg, B.S., Washington University, 1928; M.D., 1932.

Benjamin Milder, M.D., Washington University, 1939.

Harry David Rosenbaum, M.D., Washington University, 1934.

Bernd Silver, B.S., University of Louisville, 1952; M.D., 1956.

Research Assistant Professor

Nigel Daw, B.A., Trinity College, 1956; M.A., 1961; Ph.D., Johns Hopkins University, 1967. (See Department of Physiology and Biophysics)

Instructor

Stephen Waltman, B.S., Massachusetts Institute of Technology, 1961; M.D., Yale University, 1964. (On leave of absence)

Instructors (Clinical)

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.

William Steven Joffe, A.B., Washington University, 1959; M.D., 1963.

Matthew Newman, A.B., Vanderbilt University, 1956; M.D., Columbia University, 1959.

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.

Elaine Miller, A.B., Judson College, 1944; M.D., Medical College of Alabama, 1949. (See Department of Pediatrics)

Gerard M. Shickman, A.B., Washington University, 1955; M.A., 1956; Ph.D., Harvard University, 1960.

Frank L. Tobey, Jr., B.S., University of Michigan, 1947; M.S., 1948; Ph.D., 1962.

Assistants

Lisa M. Cibis, M.D., University of Heidelberg, 1939; Certified Orthoptist, Washington University, 1956.

William A. Moor, A.B., Washington University, 1934.

Research Assistants

Dorothy G. Cooper, R.N., Washington University, 1953; B.S.N., 1964; M.S.N., 1966.

Nels J. Holmberg, B.S., Oklahoma State University, 1963; M.S., 1966.

SECOND YEAR

Ophthalmology. Lectures and demonstrations are given in the basic principles of ophthalmology. (Staff)

THIRD YEAR

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

FOURTH YEAR

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 in Ophthalmology. One student rotates through the Department of Ophthalmology for a period of six weeks. The first three weeks is an introduction-orientation period. He is given instruction in the basic principles of an ophthalmologic examination, including slit lamp biomicroscopy, motility evaluation, neuro-ophthalmologic evaluation, perimetry, ophthalmoscopy, tonometry, etc. He assists in the work-up of eye patients at the St. Louis Veterans Administration Hospital and at McMillan Hospital, and attends all rounds and conferences. This elective is primarily geared to the student who plans to enter the specialty of ophthalmology.

Research Electives

Retinal physiology. (Dr. Enoch)

Experimental and clinical research in glaucoma. (Dr. Podos)

Experimental and diagnostic ophthalmic pathology. (Dr. M. Smith)

Experimental research in ocular physiology. (Dr. R. Moses)

Note—The number preceding the course title 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.

Department of Otolaryngology

Otolaryngology is presented to students during their sophomore, junior, and senior years. Clinical pathologic correlation lecture series is presented to the sophomores. In the junior year each student spends two weeks on one of the services at McMillan, St. Louis Veterans Administration, Max C. Starkloff, or Homer G. Phillips Hospitals. During this period there is teaching at the bedside, in the operating room, and at the clinic. This is supplemented by daily afternoon lectures, grand rounds on Thursdays, and an introduction to audiology as well as to basic ENT research.

The ENT rotation is highlighted by a field trip to an outlying community where a full-time member of the Department evaluates

and treats a large number of adults and children with common ENT problems. Those senior students who show a special interest may take a rotating elective in ENT. The elective can be suited to the interests of the student. Some possibilities include research or clinical work. Ample research facilities and ongoing projects are available. Clinical exposure could include oncologic diseases related to the head and neck, otologic diseases, otoneurology, audiology, or middle ear surgery.

Lindburg Professor and Head of Department

Joseph H. Ogura, A.B., University of California, 1937; M.D., 1941.



Professor

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.

Professors Emeriti

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)

Theodore E. Walsh, B.A., Cambridge University (England), 1921; M.R.C.S., L.R.C.P., London, 1925. (Also Lecturer)

Research Professor Emeritus and Lecturer

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

Associate Professors

Hugh Biller, M.D., Marquette University, 1960.

William F. Marovitz, 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.

Malcolm H. Stroud, M.B., Ch.B., University of Birmingham, 1945; L.R.C.P., M.R.C.S., 1946; F.R.C.S., 1949.

Ruediger Thalmann, M.D., University of Vienna, 1954.

Associate Professor (Clinical)

Ben H. Senturia, A.B., Washington University, 1931; M.D., 1935.

Associate Professor Emeritus (Clinical)

French K. Hansel, M.D., St. Louis University, 1918.

Assistant Professors

William A. Carver (Audiology), B.A., University of Southern California, 1951; M.A., 1955; Ph.D., 1960.

David Crowley (Physiological Acoustics), B.A., Middlebury College, 1961; M.A., University of Vermont, 1963; Ph.D., Princeton University, 1965.

Joseph E. Harvey, B.A., University of California, 1954; M.A., 1964; Ph.D., 1968. (See Department of Anatomy)

Mark May, B.S., Dickinson College, 1957; M.D. Hahnemann Medical College, 1961.

Donald G. Sessions, A.B., Princeton University, 1958; M.D., Washington University School of Medicine, 1962.

Gershon J. Spector, B.A., Johns Hopkins University, 1960; M.D., University of Maryland School of Medicine, 1964.

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.

Research Instructors

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

Magdalena P. Hodapp, B.S., University of Mexico, 1958; M.S., St. Louis University School of Medicine, 1965.

Instructors (Clinical)

Benard Adler, B.S., Washington University, 1937; M.D., 1937.

Charles C. Jacobs, A.B., Washington University, 1942; M.D., 1945.

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.

Assistants

Barbara Durso (Audiology), B.A., Jersey City State College, 1968; M.S., Washington University, 1970.

Jacquelyn J. Scorza (Audiology), B.A., Parsons College, 1944; M.A., University of Iowa, 1957.

Research Assistants

Loretta E. Anshutz, B.S., Fordham University, 1960.

David R. Belluci.

Charles Carr.

Thomas H. Comegys, B.A., Central Methodist College, 1966.

George Holtzsch, B.A., Southern Illinois University, 1962; M.A., 1966.

Ronnie J. Marovitz, B.A., Washington University, 1968.

Connie B. Speaker, B.S., Mount Union College, 1963; M.S., University of Illinois, 1965.

Sylvia N. Swanson, B.A., Washington University, 1971.

Isolde Thalmann, B.S., Washington University, 1969.

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. Two weeks.

(Drs. Pratt, Biller, May, Diehl)

FOURTH YEAR

Electives

Structure and Innervation of Labyrinth.

(Dr. Marovitz)

Clinical Clerkship. A three-week rotation in areas of otology, laryngology, and head-neck surgery.

(Drs. Ogura and Clinical Staff)

Basic Science Review. Fundamental principles of anatomy and physiology of head and neck; lectures and dissection.

(Dr. Marovitz and Staff)

Research Electives

Cytology, neurology, and histochemistry of membranous labyrinth.

(Dr. Marovitz)

Physiology of larynx.

(Drs. Ogura, Harvey)

Nasopulmonary physiology. (Dr. Ogura)

Metabolism of the inner ear. Physiological and biochemical aspects.

(Dr. Thalmann)

Otoneurology labs.

(Dr. Stroud)

Development of otic capsule and ossicles.

(Dr. Marovitz)

Audiology.

(Dr. Carver)

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 pathological conferences conducted in collaboration with the clinical departments.

Edward Mallinckrodt Professor and Head of the Department

Paul E. Lacy, B.A., Ohio State University, 1945; M.D., 1948; M.S., 1948; Ph.D., University of Minnesota, 1955.

Professors

Lauren V. Ackerman (Pathology and Surgical Pathology), A.B., Hamilton College, 1927; M.D., University of Rochester, 1932.

Allen C. Enders, A.B., Swarthmore College, 1950; A.M., Harvard University, 1952; Ph.D., 1955. (See Department of Anatomy)

Joe W. Grisham, A.B., Vanderbilt University, 1953; M.D., 1957. (See Department of Anatomy)

Thomas R. Hamilton, A.B., University of Missouri, 1932; M.D., University of Kansas, 1935; M.S., 1941. (St. Louis V.A. Hospital)

John Kissane, A.B., University of Rochester, 1948; M.D., Washington University, 1952. (See Department of Pediatrics)

Ruth Silberberg, M.D., University of Breslau, 1931.

Richard Torack, B.S., Seton Hall University, 1948; M.D., Georgetown University, 1952. (See Department of Anatomy)

Associate Professors

Walter C. Bauer, B.S., Ohio State University, 1946; M.D., Washington University, 1954.

Milton N. Goldstein, B.S., Western Reserve University, 1946; M.S., 1947; Ph.D., 1954. (See Department of Anatomy)

Marie Greider, B.S., Ohio State University, 1949; M.S., 1955; Ph.D., 1960.

Phyllis M. Hartoft, B.S., University of Michigan, 1949; M.A., University of Toronto, 1951; Ph.D., 1954.



Leonard Jarett (Laboratory Medicine) B.A., Rice University, 1958; M.D., Washington University, 1962. (See Department of Medicine)

Gerald Kessler, B.S., City College of New York, 1950; M.S., University of Maryland, 1952; Ph.D., 1954. (Jewish Hospital)

Erwin R. Rabin, A.B., Washington University, 1952; M.D., Washington University, 1956. (Jewish Hospital)

William W. Schlaepfer, B.A., Princeton University, 1954; M.D., Yale Medical School, 1958.

Morton E. Smith, B.S., University of Maryland, 1956; M.D., University of Maryland, 1960. (See Department of Ophthalmology)

Alex C. Sonnenwirth, A.B., University of Nebraska, 1950; M.S., Purdue University, 1953; Ph.D., Washington University School of Medicine, 1960. (See Department of Microbiology) (Jewish Hospital)

Mario Werner (Laboratory Medicine), M.D., Swiss Federal Institute of Technology, 1956. (See Department of Medicine)

Joseph R. Williamson, A.B., Phillips University, 1954; M.D., Washington University, 1958. (See Department of Anatomy)

Assistant Professors

Waguih M. Abdel-Bari, B.A., School of Science, Cairo, 1948; M.D., Ein Shams University, Cairo, 1953; Ph.D., Washington University School of Medicine, 1965.

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

Francisco Barrios-Granguillhome, M.D., National University of Mexico, 1938.

John D. Bauer, B.Sc., University of Innsbruck, 1938; L.R.C.P. and S., University of Glasgow, 1944; M.D., Marquette University, 1947.

C. Elliott Bell, Jr., (Laboratory Medicine), B.S., Tulane University, 1960; M.D., 1964. (See Department of Internal Medicine)

Gustave L. Davis, B.A., Union College, 1959; M.D., State University of New York, College of Medicine, 1963. (Jewish Hospital)

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

Valgard Jonsson (Laboratory Medicine), B.S., North Dakota State University, 1958; M.S.P.H., University of North Carolina, 1961; Ph.D., 1965. (Public Health Service)

Harold S. Kaplan (Laboratory Medicine), A.B., Oberlin College, 1958; M.D., Albert Einstein College of Medicine, 1962. (See Department of Medicine)

Nadya Konikov, B.S., Boston University, 1947; M.D., 1950. (Starkloff Hospital)

Mery Kostianovsky, M.D., Universidad Nacional del Litoral (Rosario, Argentina), 1958. (St. Louis V.A. Hospital)

Frederick T. Kraus, B.A., College of William and Mary, 1951; M.D., Washington University, 1955.

Charles Kuhn, A.B., Harvard University, 1955; M.D., Washington University, 1959.

Michael Kyriakos, B.S., City College of New York, 1958; M.D., Albert Einstein College of Medicine, 1962.

Virgil Loeb, Jr., M.D., Washington University, 1944. (See Department of Medicine)

David N. Menton, B.S., Mankato State College, 1959; Ph.D., Brown University, 1966. (See Department of Anatomy)

John S. Meyer, B.A., Yale University, 1952; M.D., Washington University, 1956. (Jewish Hospital)

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

William R. Platt, B.S., University of Maryland, 1936; M.D., 1940.

Juan Rosai, B.S., Colegio Nacional #9, 1956; M.D., Escuela de Medicina, 1961.

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)

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

Thomas W. Tillack, A.B., University of Rochester, 1959; M.D., Yale University, 1963. (Effective January 1, 1971)

Instructors

Madhu Bahl, F.Sc., K. M. V. College, 1958; M.D., Christian Medical College, 1963. (Starkloff Hospital)

Henry M. Cherrick, A.A., University of Florida, 1961; D.D.S., Medical College of Virginia, 1965; M.S., Indiana University, 1970. (Also School of Dentistry)

Emily H. Coch, B.S., City College of the City of New York, 1962; Ph.D., Duke University, 1970. (Jewish Hospital)

Marcos G. Cruz, A.B., Manila Central University, 1952; M.D., 1957. (St. Louis V.A. Hospital)

Robert R. Dahlgren, B.S., Oklahoma State University, 1962; D.V.M., 1963; M.S., 1966.

Louis P. Dehner, A.B., Washington University, 1962; M.S., 1966. (See Department of Obstetrics and Gynecology)

Eugene Hoff, B.A., Washington University, 1960; M.S., Yale University, 1961; M.D., Columbia University, 1963; Ph.D., University College of London, 1971.

Rodolfo A. Lattore, M.D., University of the East-Ramon Magsayay Memorial Medical Center, 1961.

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

Richard G. Lynch, B.A., University of Missouri, 1961; M.D., University of Rochester, 1966.

Napoleon Maminta, M.D., University of the Philippines, College of Medicine, 1956.

Kathleen S. McLaughlin, B.S., St. Louis University, 1960; M.D., Washington University, 1964. (DePaul Hospital)

Manuel F. Menendez, B.S., University of Havana, 1949; M.D., 1956.

Richard Payne, B.S., Ohio University, 1960; M.D., Washington University, 1963. (Starkloff Hospital)

Carlos Perez-Mesa, M.D., University of Havana, 1950.

Ursula Scalford, B.S., Howard University, 1942; M.D., 1945.

Laurence A. Sherman, B.A., University of Chicago, 1956; M.D., Albany Medical College, 1964. (See Department of Medicine) (Jewish Hospital)

Shirley W. Silbert, B.A., Fresno State College, 1958; M.D., Stanford Medical School, 1962. (St. Louis V.A. Hospital)

Minor B. Vargas, B.A., Colegio Seminario, 1957; M.D., Universidad Nacional Autonoma de Mexico, 1962.

Mario Velez, M.D., Universidad de Caldas, 1959. (Starkloff Hospital)

Bruce L. Webber, M.D., University of Witwatersrand Medical School, 1963.

Chi-Sun Yeh, M.B., National Defense Medical Center (Taiwan), 1959. (St. Louis V.A. Hospital)

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

Research Assistants

Edward H. Finke, B.S., Washington University, 1962.

Jose Gomez-Acebo, M.D., Madrid University, 1956.

James Gottfried, B.S., University of Dayton, 1964. (Starkloff Hospital)

Maria C. LaValle, A.B., Hunter College, 1963.

Kenneth E. Moore, B.S., Nebraska State College, 1960. (Jewish Hospital)

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 postmortem technique and in gross pathology. (Staff)

THIRD AND FOURTH YEARS

Clinical 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 postmortem findings. One hour a week during the third year. (Staff)

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

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. (Staff)

598. *Endocrine Pathology*. A study of disease processes involving the endocrine system, including endocrine functions of the kidney and gastrointestinal system in addition to the classical endocrine glands. Correlation of macromolecular structure and function of both natural disease and experimentally induced conditions is emphasized. Two units.

(Dr. P. Hartroft and Staff)

Seminar Electives

Ultrastructural Pathobiology. This seminar is 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. Grisham 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)

Correlative Pediatric Pathology (may be taken only as a continuation of correlative pathology). In-depth presentation of selected topics on disease constellations pe-

culiar to the pediatric age group, including recent advances in morphology and clinical pathologic correlation. Topics include the newborn lung, fibrocystic disease, etc.

(Dr. Kissane)

Research Electives

The research activities of the senior staff encompass basic investigations of nearly all of the major disease entities of man. Students interested in a research elective may consult either the chairman of the Department or the particular senior staff member who is working in his area of interest.

Note—The number preceding the course title 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.

The Edward Mallinckrodt Department of Pediatrics



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 children under sixteen years of age with all types of medical problems. Hospital admittances average 6,000 annually. The Pediatric Outpatient Division 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.

John Kissane, A.B., University of Rochester, 1948; M.D., Washington University, 1952. (See Department of Pathology)

William H. McAlister, B.S., Wayne State University, 1950; M.D., 1954. (See Department of Radiology)

J. Neal Middelkamp, B.S., University of Missouri 1946; M.D., Washington University, 1948.

James E. Miller, B.S., Tulane University, 1946; M.D., Medical College of Alabama, 1949. (See Department of Ophthalmology)

Associate Professors

Alexis F. Hartmann, Jr., B.S., Washington University, 1947; M.D., 1951.

John C. Herweg, B.S., Drury College, 1943; M.D., Washington University, 1945.

Arthur L. Prensky, A.B., Cornell University, 1951; M.D., New York University, 1955. (See Department of Neurology)

Alan M. Robson, M.B.B.S., University of Durham (England), 1959; M.D., 1964. (See Department of Medicine)

William S. Sly, M.D., St. Louis University, 1957. (See Department of Medicine)

Mark A. Stewart, B.A., M.A., Cambridge University, 1953; M.R.C.S., L.R.C.P., Cambridge and St. Thomas' Hospital, 1956. (See Department of Psychiatry)

Jessie L. Ternberg, A.B., Grinnell College, 1946; Ph.D., University of Texas, 1950; M.D., Washington University, 1953. (See Department of Surgery)

Donald Lionell Thurston, B.S., Vanderbilt University, 1934; M.D., 1937.

Jean Holowach Thurston, B.A., University of Alberta, 1937; M.D., 1941.

Theresa J. Vietti, B.S., Rice University, 1949; M.D., Baylor University, 1953.

Assistant Professors

Darryl C. DeVivo, B.A., Amherst College, 1959; M.D., University of Virginia, 1964. (See Department of Neurology)

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

Ralph D. Feigin, A.B., Columbia College, 1958; M.D., Boston University, 1962.

Marvin A. Fishman, B.S., University of Illinois, 1959; M.D., 1961. (See Department of Neurology)

Antonio Hernandez, Jr., A.A., University of Philippines, 1949; M.D., Manila Central University, 1954.

Richard E. Hillman, A.B., Brown University, 1962; M.D., Yale University, 1965.

Dorothy Jeannette Jones, A.B., Oberlin College, 1930; M.D., Washington University, 1934.

Lawrence I. Kahn, A.B., University of Alabama, 1941; M.D., Louisiana State University, 1945. (See Division of Health Care Research)

Robert L. Kaufman, B.A., Washington University, 1959; M.D., 1963.

James P. Keating, A.B., Harvard University, 1959; M.D., 1963.

Charles B. Manley, Jr., A.B., University of Missouri, 1955; M.D., 1958. (See Department of Surgery)

Anthony S. Pagliara, B.S., Union College, 1960; M.D., Albany Medical College, 1965. (Howard Hughes Medical Institute Investigator) (See Department of Medicine)

Glenn T. Peake, B.A., University of Kansas, 1959; M.D., 1963. (See Department of Medicine)

Mabel L. Purkerson, A.B., Erskine College, 1951; M.D., Medical College of South Carolina, 1956. (See Department of Medicine) (On leave of absence)

Abdel S. Ragab, M.B.B.Ch., Cairo University, 1961; D.Ch., 1964; D.M., 1965; M.D., 1967.

Carl H. Smith, B.A., Swarthmore College, 1955; M.D., Yale University, 1959. (See Department of Pathology) (On leave of absence)

Warren A. Weinberg, B.A., Vanderbilt University, 1956; M.D., 1959. (See Department of Neurology)

Virginia V. Weldon, A.B., Smith College, 1957; M.D., University of Buffalo, 1962.

Harold Zarkowsky, A.B., Washington University, 1957; M.D., 1961.

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.

Sol Londe, B.S., Washington University, 1925; M.D., 1927.

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.

Research Assistant Professors

Harish C. Agrawal, B.Sc., Allahabad University (India), 1957; M.Sc., 1959; Ph.D., 1964.

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

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.

Vita J. Land, B.S., McGill University, 1961; M.D., 1965.

Helen Palkes (Psychology), B.S., Washington University, 1966; M.A., 1968.

Patricia A. Parsons (Dentistry), B.S., San Diego State College, 1953; D.D.S., Washington University, 1957.

Instructors (Clinical)

Helen M. Aff, B.S., Washington University, 1934; M.D., 1934.

Christos Antoniou, M.D., University of Athens, 1958.

Edward T. Barker, A.B., Princeton University, 1953; M.D., Washington University, 1957.

Gordon R. Bloomberg, A.B., University of Illinois, 1955; B.S., 1955; M.D., 1959.

Clifford Read 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.

Elliot F. Gellman, B.A., State University of Iowa, 1957; M.D., University of Missouri, 1961.

Alan L. Goldman, A.B., Harvard University, 1959; M.D., Washington University, 1963.

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.

Marshall B. Greenman, B.S., University of Illinois, 1946; M.D., 1948.

Roman E. Hammes, B.A., University of Iowa, 1950; M.D., 1954.

Norman Hankin, A.B., University of Wisconsin, 1940; M.D., 1943.

James L. Harwell, A.B., Washington University, 1957; M.D., University of Missouri, 1961.

Maurice J. Keller, A.B., Yale University, 1936; M.D., Columbia University, 1940.

Sheldon Kessler, M.D., St. Louis University, 1951.

Henry L. Knock, A.B., Johns Hopkins University, 1949; M.D., 1952.

Kenneth Albert Koerner, A.B., Washington University, 1935; M.D., 1941.

Norton S. Kronemer, A.B., Washington University, 1958; M.D., University of Missouri, 1962.

Marian Kuttner, M.D., Johann Wolfgang Goethe University (Frankfurt am Main), 1931.

Maurice J. Lonsway, Jr., A.B., Washington University, 1946; M.D., 1950. (See Division of Health Care Research)

Stanley B. Lyss, A.B., Harvard University, 1958; M.D., Washington University, 1962. (See Division of Health Care Research)

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 E. Nash, Jr., M.D., Meharry Medical College, 1951.

Frederick D. Peterson, A.B., Knox College, 1953; M.D., Washington University, 1957. (See Division of Health Care Research)

Eugenia M. Pierce, M.D., St. Louis University, 1958.

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)

Frederick Sargent, A.B., Yale University, 1939; M.D., Cornell University, 1943.

George Sato, M.D., Washington University, 1947.

Robert C. Schaan, A.B., Washington University, 1949; M.D., 1953.

Bernard Schwartzman, A.B., Washington University, 1931; M.D., 1935.

Richard H. Spitz, B.A., Washington University, 1946; M.D., 1952.

Donald B. Strominger, B.A., Yale University, 1949; M.D., Washington University, 1953.

Mary A. T. Tillman, M.D., Howard University, 1960.

Argyrios A. Tsifutis, M.D., Salonika University Medical School, 1954.

James K. Turner, A.B., Washington University, 1949; M.D., 1953.

Barbara Nancy Voege, B.S., University of Illinois, 1950; M.D., Washington University, 1957.

George T. Wilkins, Jr., B.S., University of Illinois, 1956; M.D., 1957.

Kathleen Winters, B.S., Winthrop College, 1946; M.D., Medical College of South Carolina, 1955.

Frank S. Wissmath, A.B., Washington University, 1939; M.D., 1943.

Gerald Wool, A.B., Princeton University, 1958; M.D., Washington University, 1962. (See Division of Health Care Research)

H. Benjamin Zwirn, M.D., University of Basel (Switzerland), 1954.

Instructors Emeriti (Clinical)

Joseph A. Bauer, M.D., Washington University, 1926.

Maurice J. Lonsway, B.S., Valparaiso University, 1910; M.D., St. Louis University, 1914.

Edwin H. Rohlfing, M.D., Washington University, 1919.

Research Instructor

Elaine Miller, B.A., Judson College, 1944; M.D., Medical College of Alabama, 1949. (See Department of Ophthalmology)

Assistants (Clinical)

Robert D. Cox, B.S., University of Notre Dame, 1945; M.D., Johns Hopkins University, 1949.

Gerald J. Duling, B.S., Xavier University, 1955; M.D., St. Louis University, 1959.

Diosdada T. Guillen, A.A., University of Santo Tomas, 1950; M.D., 1955.

Seymour M. Schlansky, M.D., Chicago Medical School, 1950.

Research Assistants

Charles Crawford, Jr., B.S., Washington University, 1956.

Charles A. Reed, A.B., Washington University, 1961.

SECOND YEAR

The student is introduced to pediatrics and to 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 reactions to injury and disease. A second series of talks highlights 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. Members of the Department also participate in the sophomore course in pathophysiology.

THIRD YEAR

A clerkship of six weeks is scheduled, during which period the student participates in the following:

1. Care of inpatients, sharing responsibility with intern or resident.
2. Daily ward rounds and bedside conferences with house staff and attending physician.
3. Daily noon and afternoon conferences on various facets of pediatrics.
4. Weekly grand rounds.

FOURTH YEAR

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

Pediatric Cardiology

Clinical Inpatient Service. Diagnosis and management of patients with acquired and congenital heart disease, including critically ill and postoperative patients in the Intensive Care Unit. Activities include daily ward rounds, precatheterization critiques three times a week, and a weekly conference on catheterization laboratory findings.

Outpatient Service. New patients for consultation, as well as follow-up of old patients. (Dr. Goldring)

Laboratory Diagnostic Procedures. The student is involved as an observer and then as a participant in conducting catheterization and angiocardiographic studies. The theory and interpretation of physiologic data are reviewed in daily sessions. The student may participate in the other activities of the Pediatric Cardiology Division as time permits.

(Dr. Hartmann, Jr.)

Research Elective. This study is concerned with the effect of digoxin (tritium labeled) on the cardiovascular hemodynamics of the fetal lamb. There will be opportunity to learn about cardiac output, blood flow and the use of isotopes (tritium labeled digoxin) in experimental procedures. (Drs. Goldring, Hernandez)

Electrocardiography, Vectorcardiography, Phonocardiography. An intensive course, with emphasis on the electrophysiology and theory as well as interpretation of electrocardiograms, phonocardiograms and vectorcardiograms of inpatients and outpatients. The student may participate in the other activities of the Pediatric Cardiology Division as time permits.

(Dr. Hernandez)

Pediatric Neurology

Clinical Elective. The student participates as a full member of the neurology ward team and is directly responsible for a proportion of the patients on the service under the direction of the senior resident. He is expected to take night call every third night, during which time he is responsible for the medical care of the entire ward, as well as for emergency admissions.

(Dr. Dodge)

Research Elective. The student has an opportunity to learn some of the chromatographic and spectrophotometric techniques frequently used in developmental neurochemistry, while working on a project of his own choosing or one that is currently in progress in the laboratory. Prior discussion is necessary.

(Drs. Pinsky, Fishman, DeVivo, Agrawal)

Research Elective. Determine actions of paraldehyde and acetaldehyde levels in the liver, lung, and kidney of animals after paraldehyde administration. A new enzymatic method for the microanalysis of paraldehyde lends itself ideally to studies of the intermediary metabolism of paraldehyde. Measurements of selected metabolites in the liver, lung, and kidney of animals injected with paraldehyde

may be revealing in elucidating the pathogenesis of the metabolic acidosis and other clinical pathologic findings reported in paraldehyde intoxication.

(Dr. Holowach)

Pediatric Infectious Diseases

Clinical Elective. The student is assigned selected patients on the Isolation Division for initial evaluation and continuing care. He attends daily ward rounds and scheduled conferences. Time is spent each day reading cultures in the diagnostic bacteriology laboratory. Instruction is given in diagnostic serology. (Dr. Middelkamp)

Research Elective. Laboratory research programs are available in the areas of (1) tissue culture; (2) fetal and neonatal viral infections; (3) electron microscopy of viral infections; (4) metabolic aspects of infectious diseases in man and a variety of animal models. Amino acids in blood and urine are studied in terms of their differential diagnostic and prognostic possibilities during active infection, and mechanisms for these changes are sought.

(Drs. Middelkamp, Herweg, Feigin)

Pediatric Hematology and Oncology. Large numbers of children with diverse hematological and oncological problems are seen. During the six-week rotation the student is expected to acquire sufficient knowledge to interpret the blood smears, bone marrows, and special laboratory studies. Concepts of management and differential diagnosis are reviewed. (Drs. Vietti, Zarkowsky, Land)

Pediatric Clinical Allergy. Complete review of allergic theory. Application of approach to patient evaluation and therapeutics. Responsibility for inpatients and outpatients, patient care, and evaluation of methods of diagnosis and therapy. Multidiscipline approach to care of allergic patients. Student is expected to complete a short library or laboratory project in ongoing research in allergy. (Dr. Thurston)

Pediatric Renal Disease. The students work up and present both inpatients and outpatients who have renal disease. Discussions

emphasize the relationship between the clinical problem and the pathophysiology underlying the disease. Clinical features are related to pathologic and immunopathologic changes. Surgical aspects of pediatric nephrology are discussed, and there are formal sessions in which renal physiology and clinical topics are reviewed by the students. Other pediatric teaching functions may be attended.

(Drs. Robson, Manley)

Pediatric Ambulatory Service. A six-week course with participation in all aspects of ambulatory care of children under the direction of St. Louis Children's Hospital staff physicians. Includes diagnosis and treatment of acute and chronic illness in general pediatric service, in private physicians' offices, and in the emergency room. Experiences in subspecialties and in community clinics are also offered.

(Dr. Jones)

Combined Pediatric and Adult Metabolism. This elective is designed to include broad clinical experience in both pediatric and adult endocrine problems. The student has an opportunity to work up all of the pediatric endocrine patients and to see most of the adult patients. He attends rounds in pediatric metabolism, pediatric-endocrine and diabetic clinics, and the adult metabolic research seminar and rounds. There is an opportunity to attend pediatric and medical grand rounds and metabolic rounds at Jewish Hospital. A large number of patients with all types of endocrine disorders are seen and studied in depth.

(Drs. Weldon, Pagliara, Daughaday)

Genetics

Medical Genetics. Twelve weeks, all day. Combined clinical and research course.

(Drs. Sly, Kaufman, Hillman)

Clinical Genetics. Six weeks, all day. Experience in clinical/laboratory approach to study of genetic problems. Students see all consultations referred to the Division of Medical Genetics. They work in Medical Genetics Clinic on Tuesday mornings, attend daily genetics rounds, and participate in scheduled seminars.

(Dr. Kaufman)

Neonatology. First three weeks, Maternity Hospital: (1) examination of the newborn, (2) delivery room care, including resuscitation, Apgar, gestational age evaluation, (3) counseling new mothers regarding the care of newborns, (4) management of the sick newborn. Second three weeks, Intensive Care Unit: Management of the severely ill newborn, especially the premature. During the six weeks, teaching rounds are held daily on Intensive Care and at Maternity. Night call approximately every third night.

(Dr. Goldman)

Seminar Electives

Future of Clinical Cancer Therapy. Interdepartmental Oncology Seminar. This multidisciplinary course correlates the problems confronting the physicians in their search for a cure of cancer. The major topics discussed are kinetics of normal and malignant cell populations, quantitative and qualitative experimental chemotherapy as it applies to clinical treatment, radiobiology and radiation therapy, immunology and immunotherapy. Other topics considered are the relationship of heredity and environment to malignancy, cellular control processes, combination therapy, etc. An attempt is made to review significant recent advances and their implications in the future management of human malignancies.

(Dr. Vietti, coordinator)

Developmental Neurobiology. This course covers selected topics in the development of the nervous system. While emphasis is given to the neurochemical aspects of brain growth and maturation, there are also discussions of the neurophysiological and functional development of the brain. The relationship between chemical, physiological, and functional development and underlying anatomical changes is stressed. The course is conducted as a seminar, with papers assigned prior to each meeting. Members of the Departments of Pediatrics and Neurology are present at these discussions to clarify obscure points and to add additional information when possible.

(Dr. Agrawal)

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 microbiology 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 closely co-ordinated with the lecture material and is designed (1) to demonstrate and emphasize pertinent pharmacological principles and (2) to employ agents, equipment, and skills relevant to current medical practice.

Professor and Head of the Department

Oliver Howe Lowry, B.S., Northwestern University, 1932; Ph.D., University of Chicago, 1937; M.D., 1937.

Professors

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

Stephen C. Kinsky, A.B., University of Chicago, 1951; Ph.D., Johns Hopkins University, 1957. (See Department of Microbiology)

David B. McDougal, Jr., A.B., Princeton University, 1945; M.D., University of Chicago, 1947.

Associate Professors

Saul Boyarsky, B.S., University of Vermont, 1943; M.D., 1946. (See Department of Surgery)

Helen B. Burch, B.S., Texas University, 1926; M.S., Iowa State University, 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.

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

Robert N. Miller, A.B., University of Missouri, 1953; M.D., 1957. (See Department of Anesthesiology)

Assistant Professors

James A. Ferrendelli, A.B., University of Colorado, 1958; M.D., 1962. (See Department of Neurology)

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.

SECOND YEAR

501, 502. (a) Lectures, conferences, panel discussions. (b) Laboratory course.
(Dr. Lowry and Staff)

Electives

521. *The Interaction of Drugs with 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 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). Minimum ten students.

(Dr. Needleman and Staff)

572. *Biochemistry of the Central Nervous System.*

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

Research Electives

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.

Problems in basic and clinical pharmacology in the urinary tract. (Dr. Boyarsky)

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

Regional CNS chemistry cyclic nucleotide metabolism. (Dr. Ferrendelli)

Lipids of the nervous system; chemistry of the synapse; psychoactive drugs.

(Dr. Burton)

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)

Immune lysis; membrane structure. (Dr. Kinsky)

Metabolism of isolated pancreatic islets. (Dr. Matschinsky)

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

The effect of anesthetic drugs on energy dependent and energy independent ion movements in isolated mitochondria. (Dr. Miller)

The pharmacological and biochemical mechanisms leading to the development of tolerance to nitroglycerine. Pharmacology of angiotensin. (Dr. Needleman)

Note—The number preceding the course title 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.

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, 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. (See Biomedical Computer Laboratory)

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

Thomas T. Sandel (Psychology), B.A., University of Texas, 1948; M.A., 1950; Ph.D., 1954. (Also College of Arts and Sciences)

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.

Harvey Lester White, B.S., Washington University, 1918; M.D., 1920.

Associate Professors

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

Mordecai P. Blaustein, B.A., Cornell University, 1957; M.D., Washington University, 1962.

Stanley Lang, Ph.B., University of Chicago, 1948, B.S., 1949; M.S., 1951; Ph.D., 1953.

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

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

Russell R. Pfeiffer (Engineering Biophysics), B.S., Purdue University, 1959; S.M., Massachusetts Institute of Technology, 1960; Ph.D., 1963. (Also School of Engineering and Applied Science)

Assistant Professors

W. Sherman Beacham (Physiology), B.S., University of Utah, 1961; M.D., 1964.

Harold Burton, B.A., University of Michigan, 1964; Ph.D., University of Wisconsin, 1968. (See Department of Anatomy)

Nigel Daw, B.A., Trinity College, Cambridge, 1956; M.A., 1961; Ph.D., Johns Hopkins University, 1967. (See Department of Ophthalmology)

Duane C. Hellam, B.A., Arizona State College, 1955; M.D., Washington University, 1959. (See Department of Internal Medicine)

Rex L. Jamison, A.B., University of Iowa, 1955; B.A., Oxford University, 1957; M.D., Harvard University, 1960. (See Department of Medicine) (Jewish Hospital)

Garland R. Marshall (Established Investigator of the American Heart Association), B.S., California Institute of Technology, 1962; Ph.D., Rockefeller University, 1966. (See Department of Biological Chemistry)

Alan Pearlman, A.B., State University of Iowa, 1958; M.D., Washington University, 1961. (See Department of Neurology)

Carl Marx Rovainen, B.S., California Institute of Technology, 1962; Ph.D., Harvard University, 1967.

Philip D. Stahl, B.S., West Liberty State College, 1964; Ph.D., West Virginia University, 1967.

Lewis J. Thomas, Jr., B.S., Haverford College, 1953; M.D., Washington University, 1957. (See Department of Anesthesiology)

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. (Staff)

504. *Neural Sciences*. A conjoint course on the structure and function of the nervous system given by the Departments of Anatomy and Physiology and Biophysics.

Electives

507. *Macromolecules*. Topics to be covered include the structure of proteins and nucleic acids and discussion of theory and instrumentation related to determination of their physical and hydrodynamic properties, with special emphasis on X-ray scattering. (Drs. Banaszak, Mathews)

509. *Polypeptide Hormones*. Structural basis for physiological action of biologically active polypeptides. (Dr. Marshall)

511. *Properties of Cell Membranes*. A consideration of active and passive membrane transport. (Dr. Blaustein)

513. *Nerve, Muscle and Synapse*. Mechanisms of conduction and synaptic transmission, excitation, and contraction of muscle. (Drs. Blaustein, Rovainen)

515. *Sensory Systems*. A detailed study of somatic, auditory, and visual physiology. (Drs. Daw, Molnar, Pearlman, Pfeiffer)

517. *Advanced Renal Physiology*. Mechanisms of glomerular and tubular function. (Dr. Jamison)

519. *Fundamentals of Circulation*. Mechanisms of cardiac muscle excitation and contraction. Analysis of peripheral circulation. Neural regulation of circulation. (Dr. Lang)

521. *Fundamentals of Respiration*. Consideration of gas transport, alveolar ventilation, and neural control of respiration. (Drs. Roos, Beacham)

590. *Research*. The Department offers a variety of research opportunities, particularly in the following areas: macromolecular structure as studied by X-ray crystallography; synthesis and biological activities of polypeptides; membrane transport; neurophysiology including nerve membrane, muscle, synaptic transmission, sensory systems (especially auditory and visual), electron microscopy of neural tissues, and biochemical regulation in neurons; circulation (especially peripheral) and heart muscle; respiration; renal physiology; and the application of computer sciences to physiological problems. (Staff)

Seminar Electives

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

Biochemistry and Physiology of Peptide Hormones. Chemical structure of peptide hormones as related to physiological action. (Dr. Marshall)

Note—The number preceding the course title 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.

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. Problems of community health and health care delivery are discussed.



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

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

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 and Division of Health Care Research)

Professor and Director of the Division of Biostatistics

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

Associate Professors

John Holloszy, M.D., Washington University, 1957. (PHS Career Development Award) (See Department of Medicine and Institute of Rehabilitation)

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

C. Kirk Osterland, M.D., University of Manitoba, 1956. (American Cancer Society Faculty Research Award) (See Department of Medicine)

R. Dean Wochner, A.B., Arizona State College, 1956; M.D., Washington University, 1960. (Acting Hospital Commissioner of St. Louis; Acting Director of Health and Hospitals) (See Department of Medicine)

Assistant Professors

William C. Banton II, M.D., Howard University, 1946; M.P.H., Johns Hopkins University, 1970. (Commissioner of Health of the City of St. Louis)

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)

Lorraine Lake, B.S., Washington University, 1950; M.A., 1954; Ph.D., 1962. (See Institute of Rehabilitation, Department of Anatomy, and Program in Physical Therapy)

Isaias Spilberg, B.S., University of San Marcos (Lima, Peru), 1956; M.D., 1963. (See Department of Medicine) (Starkloff Hospital)

John D. Vavra, 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. (See Division of Health Care Research)

M. Anita Whitney, B.S., McGill University, 1952; M.S., Cornell University, 1954; Ph.D., Michigan State University, 1962. (See Division of Health Care Research)

Assistant Professor (Clinical)

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

Instructors

Evelyn E. Bonander (Social Work and Rehabilitation), B.A., Gustavus Adolphus College, 1959; M.S.W., Washington University, 1966.

Ray A. Boone (Physical Therapy and Rehabilitation), B.S.P.T., Washington University, 1967.

Ruth E. Brennan (Nutrition), B.S., University of Tennessee, 1943; M.S., Simmons College, 1945; Sc.D., University of Pittsburgh, 1966.

Bevra Hannahs Hahn (Clinical Immunology), B.Sc., Ohio State University, 1960; M.D., Johns Hopkins University, 1964. (See Department of Medicine)

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

Mary Lynn Meyer (Occupational Therapy and Rehabilitation), B.S., Washington University, 1967.

Edward J. Miller (Clinical Immunology), B.A., St. John's University, 1958; M.D., St. Louis University, 1962. (See Department of Medicine)

Martha A. Minteer (Rehabilitation Medicine), B.S., Carnegie-Mellon University, 1958; M.D., University of Pittsburgh, 1964. (Jewish Hospital)

Gerald G. Morris, A.B., George Washington University, 1962; M.D., 1965. (See Department of Medicine) (Also Student Health Service)

Barbara Nash (Physical Therapy and Rehabilitation), B.S.P.T., Washington University, 1949.

Barbara J. H. Norton (Physical Therapy), B.S., Washington University, 1966.

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

Elizabeth A. Stoddard (Rehabilitation), B.S., Montana State University, 1954; M.D., Washington University, 1957. (Jewish Hospital)

Ellen T. Tyson (Occupational Therapy and Rehabilitation), B.A., Syracuse University, 1949; M.A., 1950.

Research Instructors

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

Lecturers

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

William Stoneman III, B.S., St. Louis University, 1948; M.D., 1952. (Also Director, Bi-State Regional Medical Program for Heart, Cancer, and Stroke)

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.

(Dr. 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. Patterns of provision of medical care and the social factors influencing health care needs are discussed.

(Dr. Shank and Staff)

Summer Traineeships in Physical Disability and Rehabilitation. (See Institute of Rehabilitation.) (Drs. Chaplin, Holloszy)

FOURTH YEAR

Electives

Health Care Delivery in a Deprived Community. Students are supervised in investigating or evaluating an aspect of health care delivery in a low income community. Topics for study are selected by students and faculty. Representative of the type of study considered appropriate are: studies of methods for funding neighborhood health projects; community directors and community action programs; use of non-medical personnel for health care delivery; patient attitudes toward health care; interrelationships between an inner city clinic and various health services; hospital record systems; role of students in a service-oriented clinic; scope of medical care in neighborhood health projects; relation between health, social, legal, and other community services. Each student is responsible for assembling pertinent data, analyzing the information, preparing a written report, and presenting his findings in a seminar.

(Dr. Perkoff and Staff)

Study in Private and Group Clinical Practice. A preceptorship in clinical internal medicine or pediatrics will be offered for six or twelve weeks for one to eight students. Students join individual physicians in their private practice and in the experimental group practice of the Division of Health Care Research—Medical Care Group of Washington University. Students work in the physician's office caring for patients under supervision. Preventive, social, and continuing aspects of medical practice are emphasized. Students accompany their supervisory physician on hospital rounds and share night and house or emergency calls with the supervisory physician. Students also attend hospital staff and committee meetings with their supervisory physician. Each student keeps a simple diary of his daily experience and writes a detailed analysis of one patient, including pertinent social and community aspects of the problems presented. This elective is designed to give an overview of medical practice in internal medicine and in pediatrics, and to provide an opportunity for the students to

see comprehensive medical care as it is practiced in St. Louis, and as it exists in a group practice model.

(Dr. Perkoff and Staff)

Clinical Elective. Physical Disability and Rehabilitation. (See Institute of Rehabilitation)

(Drs. Chaplin, Holloszy)

Biomedical Statistics. Students are supervised and gain experience in the proper application of statistical methods (including computer usage) to health research problems; qualified students also engage in research projects concerned with the development of statistical methods for special biomedical and clinical research situations.

(Drs. Wette, Choi, Division of Biostatistics)

Physical Disability and Rehabilitation. The student becomes familiar at first hand with the techniques for defining the extent of physical disability and with various approaches to its treatment. Emphasis is 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. Supervised visits are arranged to related outside facilities and agencies. Selected patients are assigned to the student for his supervision. In general, these include inpatients on the Pediatrics, Medical, Neurology, Neurosurgical, Orthopedic, and Plastic Surgery Services. Special emphasis on any one or any combination of the above services can be arranged to suit the interests of individual students. Although the student is based in the Rehabilitation Institute, he is encouraged to follow his patients in the various areas of the Medical Center where they receive care.

(Dr. Chaplin)

Long-Term Care. The Division of Long-Term Care of Jewish Hospital offers a six- or twelve-week elective course to senior medical students. The Division operates a thirty-six bed service for patients with physical disabilities under the supervision of three full-time physicians. The case material is varied by the large number of



patients with spinal cord injuries, strokes, Parkinson's disease, and arthritis. The Division holds an Amputee Clinic twice a month and does all the electromyographic examinations for the Jewish Hospital. The medical student serves as an extern. He gains experience in the prescription of a rehabilitation program and follows his patients in physical therapy, occupational therapy, speech therapy, or whatever other activity is applicable. He works with the orthopedic, neurological, urological, and plastic surgery consultants who serve this unit. The details of the program can be adapted to fit the particular interests of the individual student.

(Dr. Steinberg and Staff)

Seminar Electives

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.

(Drs. Osterland, Chaplin, J. Smith, C. W. Parker)

Clinical Nutrition. The series of seminars is concerned with nutrient requirements of humans, review of the metabolic roles of individual nutrients, modification of nutrient requirements by disease processes, deficiency diseases, obesity, hypervitaminoses, the role of diet in the occurrence of a variety of diseases, and dietary manipulation in the treatment of various disorders. Readings are assigned; case presentations are utilized when appropriate.

(Drs. Shank, Morrison, Holloszy, Brennan)

Methods of Biomedical Statistics. The principles and application of statistical methods in the health sciences, with emphasis on the treatment of statistical problems typical in biomedical and clinical research. The usefulness and limitations of standard statistical techniques; *t*-, *F*-, and chi-square tests; correlation and regression; analysis of variance and covariance; life-tables. The rationale and applications of advanced biometrical methods: sequential analysis, especially in clinical trials; quantal response analysis; multivariate analysis; distribution-free methods. Special topics in health research: incomplete (censored) observations, mixed and competing risk distributions, classification and clustering analysis. Computer applications in biomedical statistics (with laboratory experience).

(Dr. Wette)

Topics in Health Care Delivery. Student-led discussions of community medicine, social aspects of medical care systems, and alternative structures which can improve health care delivery are directed by faculty members. Topics covered in an elective period vary according to the faculty member assigned; course content, therefore, is not the same for all students. The seminars follow assigned readings on specific topics, with presentations made by each course participant. Simultaneous participation in the Pruitt-Igoe Project is encouraged but not required.

(Dr. Perkoff and Staff)

Research Electives

Biochemistry of Exercise. Research deals with the acute and chronic responses to exercise. Areas of interest include biochemical adaptations in muscle in response to endurance exercise and to heavy resistance exercise; effects of exercise on body composition during growth and during weight

reduction; cardiac adaptations to increased work load; the serum triglyceride lowering effect of exercise; the biochemical basis of muscle fatigue. (Dr. Holloszy)

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

(Drs. Wette, Choi)

Clinical and Experimental Nutrition. The student engages in a selected research project under supervision of staff of this laboratory. Occasional opportunities may be made to study and observe major problems of deficiency disease in other countries.

(Drs. Shank, Morrison, Holloszy, Brennan, Cheng)

Immunohematology. Application of serologic and immunochemical techniques in basic studies of erythrocyte autoantibodies and isoantibodies encountered in hemolytic disease of the newborn, leukemias, lymphomas, malignancies, and connective tissue diseases. Special problems in transfusion practice are also covered with Dr. Harold Kaplan and the blood bank personnel.

(Dr. Chaplin)

Immunology and Immunochemistry. Dysproteinemias (serum protein abnormalities); autoimmune diseases, autoantibodies (NZB mouse model of SLE), immunochemical studies of globulins.

(Dr. Osterland)

Mathematical Biology. Qualified students may engage in research concerned with the mathematical modeling and analysis (including computing techniques) of biologic processes such as tumor growth and radiation response.

(Dr. Wette)

Objective Quantitation of Spasticity. The student collaborates with the staff of the Biomedical Engineering Research and De-

velopment Unit, employing electronic instrumentation to obtain objective measurements of spasticity and impaired voluntary motor function in patients with neurological disorders. The equipment includes electrically driven and hydraulic systems, EMG recordings, and computer analysis of data. Machine findings are correlated with clinical performance based on standardized functional evaluation tests.

(Dr. Chaplin and Staff)

Medical Care in a Group Practice. Students select a problem of mutual interest dealing with medical care utilization, reaction to illness, screening, etc. (Dr. Perkoff)

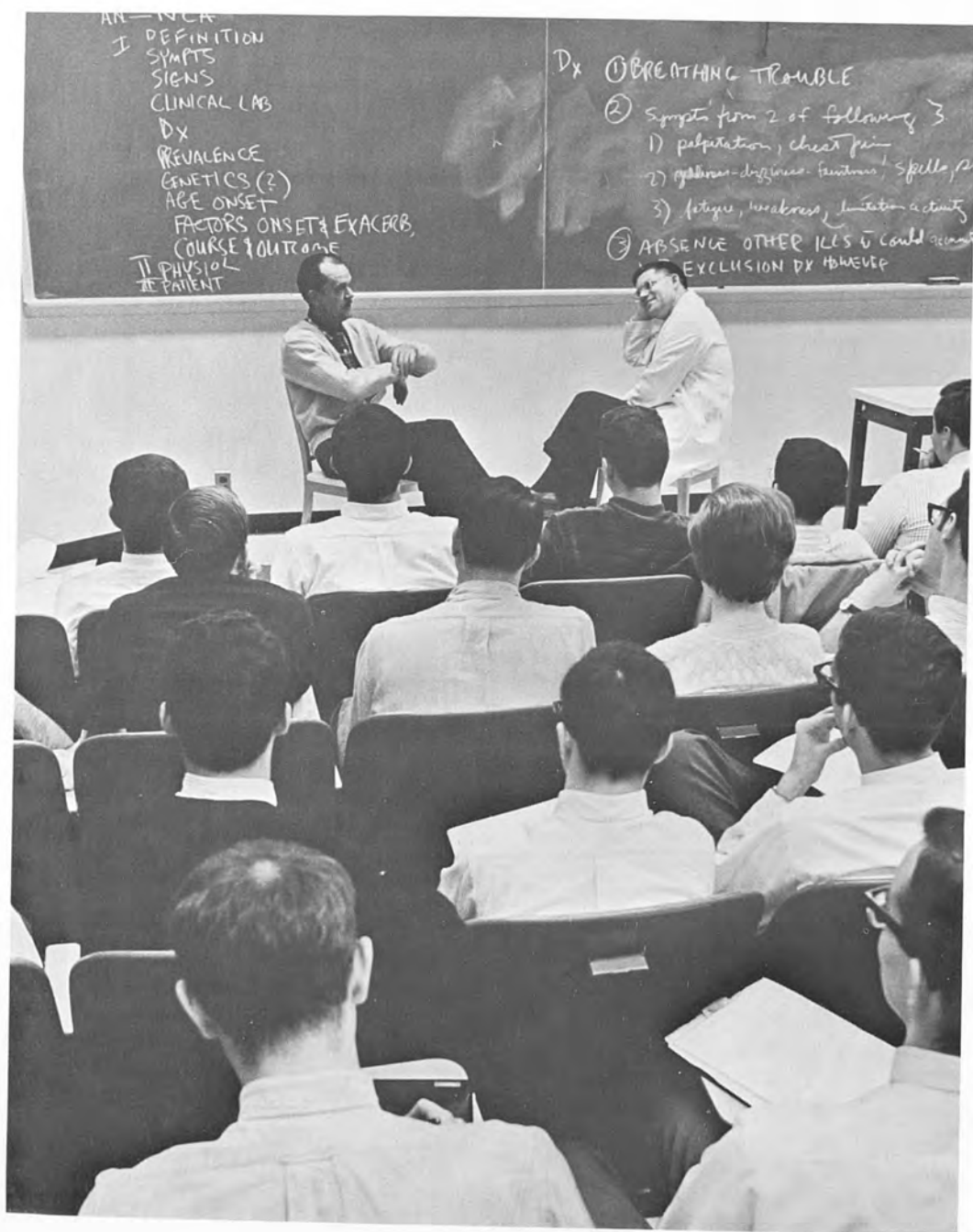
Studies in Adult Ambulatory Care. Studies of medical care utilization, social and economic aspects of medical care, problems in medical care organization at Barnes or an affiliated hospital, or in community projects.

(Dr. Perkoff)

Studies in Pediatric Ambulatory Care. Same as in Adult Ambulatory Care, but at St. Louis Children's or St. Louis County Hospital, or a community project.

(Dr. Kahn)

Economic, Social, Political Aspects of Medical Care. Studies of attitudes of physicians and patients and studies of medical care organization for the poor. (Dr. Whitney)



Department of Psychiatry

Instruction in psychiatry is given in the last three years of the medical course. Emphasis is on teaching psychiatry as a medical discipline, including the biological, social, and psychological mechanisms and manifestations of psychiatric illness, as well as psychological reactions to other illnesses. Recognition of current limitations of knowledge combined with an appreciation of what is known leads to a spirit of constructive skepticism. This attitude permits the student to study psychiatry in depth and broadly without preconceived theories.

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)

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.

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 College of Arts and Sciences)

John A. Stern (Psychology), A.B., Hunter College, 1949; M.S., University of Illinois, 1951; Ph.D., 1953. (Also College of Arts and Sciences)

Mark A. Stewart, B.A., M.A., Cambridge University, 1953; M.R.C.S., L.R.C.P., Cambridge and St. Thomas' Hospital, 1956. (See Department of Pediatrics)

George Winokur, A.B., Johns Hopkins University, 1944; M.D., University of Maryland, 1947.

Blanche Ittleson Professor of Child Psychiatry

E. James Anthony, B.S., University of London, 1938; M.R.C.S., L.R.C.P., 1941; M.B., B.S., 1942; D.P.M., 1947; M.D., 1949.

Associate Professors

Richard W. Hudgens, M.D., Washington University, 1956.

Lucy J. King, A.B., Washington University, 1954; M.D., 1958.

William R. Sherman (Biochemistry), A.B., Columbia University, 1951; Ph.D., University of Illinois, 1955.

Kathleen Smith, B.S., University of Arkansas, 1944; M.D., Washington University, 1949. (Malcolm Bliss)

Robert A. Woodruff, Jr., A.B., Harvard University, 1956; M.D., 1960.

Associate Professors (Clinical)

Alex H. Kaplan, B.S., College of City of New York, 1932; M.D., St. Louis University, 1936.

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)

Associate Professor Emeritus (Clinical)

Margaret C-L. Gildea, B.S., University of Chicago, 1923; M.D., Yale University, 1936.

Research Associate Professor

David J. Pittman (Sociology), A.B., University of North Carolina, 1949; M.A., 1950; Ph.D., University of Chicago, 1956. (Also Jewish Hospital)

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, 1934; M.A., 1942; Ph.D., Ohio State University, 1950. (Also College of Arts and Sciences)

Theodore J. Cicero (Neuropsychology), B.S., Villanova University, 1964; M.S., Purdue University, 1966; Ph.D., 1968.

Paula J. Clayton, B.S., University of Michigan, 1956; M.D., Washington University, 1960.

James E. Edwards, B.A., University of Tennessee, 1959; M.D., 1962. (Malcolm Bliss)

Donald S. Goodwin, A.B., Baker University, 1953; M.D., Kansas University, 1964.

Julian C. Hall (Social Work), B.S., University of Louisville, 1949; M.S., 1951. (Malcolm Bliss)

Marijan Herjanic, M.D., Zagreb University, 1956. (Malcolm Bliss)

James N. McClure, Jr., A.B., Washington University, 1951; M.D., 1955.

John W. Olney, B.A., State University of Iowa, 1956; M.D., 1963.

Vernon J. Perez (Neuropsychology), B.S., Tulane University, 1957; M.S., 1960; Ph.D., Washington University, 1964. (Also College of Arts and Sciences)

Barbara Powell (Medical Psychology), Ph.D., Washington University, 1964. (Malcolm Bliss) (Also College of Arts and Sciences)

Marcel T. Saghir, B.Sc., American University of Beirut, 1959; M.D., 1963.

Lawrence G. Sharpe (Neuropsychology), B.A., Florida State University, 1959; M.A., San Jose State College, 1964; Ph.D., Purdue University, 1968. (Also College of Arts and Sciences)

Vincente B. Tuason, M.D., University of Santo Tomas, 1955. (Malcolm Bliss)

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)

John F. Bergmann, A.B., Washington University, 1950; M.D., 1954.

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.

Alan G. Craig, M.D., (M.B., Ch.B.), Aberdeen University, 1951.

Robert Bailey Deitchman, B.A., University of Virginia, 1949; M.D., 1953.

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.

Edward H. Kowert, A.B., Washington University, 1940; M.D., 1943.

Wanda M. Lamb, B.S., University of Missouri, 1946; M.D., Washington University, 1948.

Sydney B. Maughs, A.B., Westminster College, 1931; M.D., Washington University, 1935.

Roy M. Mendelsohn (Child Psychiatry), B.S., University of Illinois, 1950; M.D., 1952.

Marie O. Mowrer, A.B., Southern Illinois University, 1947; B.S., University of Illinois, 1949; M.D., 1951.

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.

Research Assistant Professors

Boaz Kahana (Child Psychiatry), B.A., Yeshiva University, 1955; M.S., 1957; Ph.D., University of Chicago, 1966.

Manon McGinnis (Psychiatric Social Work in Child Psychiatry), B.A., Westhampton College, 1927; M.S.W., Pennsylvania School of Social Work, 1929.

Instructors

Anna K. Bradley (Social Work), B.J., University of Missouri, 1956; M.S.W., Washington University, 1958. (Malcolm Bliss)

Marguerite Cannon (Social Work), B.S., St. Louis University, 1936; M.S.W., Washington University, 1948.

Juan C. Corvalan, M.D., Universidad Nacional Cuyo Argentina, 1965.

Sompong Daengsurisri, M.D., University of Medical Science, Bangkok, 1957. (Malcolm Bliss)

Plaridel C. Deza, M.D., University of Santo Tomas, 1956. (Malcolm Bliss)

Kimon Efstathianos, M.D., National University of Athens, 1951. (Malcolm Bliss)

Adele Feldman (Child Psychiatry), B.A., New York University, 1945; M.S.W., University of Denver, 1957.

Eduardo Garcia, M.D., Havana University, 1952. (Malcolm Bliss)

Douglas R. Gowler (Child Psychiatry), M.D., Manitoba College, 1957.

James A. Halikas, B.S., Brooklyn College, 1962; M.D., Duke University, 1966.

Nancy C. Kurtz (Psychiatric Social Work in Child Psychiatry), B.A., University of Cincinnati, 1958; M.S.W., Ohio State University, 1968.

Jane B. Landsbaum (Medical Psychology), B.A., Washington University, 1961; Ph.D., 1968. (Malcolm Bliss)

Walter Ling, M.D., Chulalongkorn University Medical School, Bangkok, 1963. (Malcolm Bliss)

Nancy Jane Lowe (Medical Psychology), M.A., University of Chicago, 1950; Ph.D., Washington University, 1970.

Sue Marten, B.A., University of Missouri, 1960; M.D., 1962.

Elizabeth C. Penick (Medical Psychology), B.A., Sophie Newcomb College, 1957; M.S., Tulane University, 1960. (Malcolm Bliss)

Janet Sue Portell (Psychiatric Social Work in Child Psychiatry), B.A., Southern Illinois University, 1965; M.S.W., Washington University, 1967.

Daniel Pugh, B.A., Carleton College, 1960; M.D., Washington University School of Medicine, 1964. (Malcolm Bliss)

H. M. A. Rahman, M.D., King Edward Medical College, 1958. (Malcolm Bliss)

Adolfo E. Rizzo (Child Psychiatry), M.D., Buenos Aires University, 1955. (St. Louis State Hospital)

Elizabeth M. Smith (Social Work), B.A., University of Nebraska, 1960; M.S.W., 1962.

Eve Love Sutton (Psychiatric Social Work in Child Psychiatry), B.A., University of Kentucky, 1957; M.S.W., St. Louis University, 1964.

Houshang Vafi, M.D., University of Tehran, 1961. (Malcolm Bliss)

Robert H. Vanderpearl, A.B., Washington University, 1951; M.D., 1956. (Malcolm Bliss)

Jorge A. Viamontes, M.D., Havana University, 1948; Ph.D., Ignacio Agramonte University, 1957. (Malcolm Bliss)

Marilyn Voerg (Medical Psychology in Child Psychiatry), B.A., University of Florida, 1950.

Richard D. Wetzel, B.A., Concordia College, 1959; B.D., Concordia Seminary, 1963.

Instructor Emeritus and Lecturer

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

Instructors (Clinical)

John M. Anderson, B.S., Colorado State University, 1938; M.D., Meharry Medical College, 1958. (Malcolm Bliss)

Libby G. Bass (Medical Psychology), B.A., University of Illinois, 1928; M.A., Northwestern University, 1929.

William W. Clendenin, M.D., University of Tennessee College of Medicine, 1963. (Malcolm Bliss)

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.

Alejandro M. Datuin, A.A., University of Santo Tomas, 1951; M.D., 1956. (Malcolm Bliss)

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.

Robert S. Hicks, A.B., Hendrix College, 1951; M.D., University of Arkansas, 1958.

R. Eugene Holemon, A.B., Washington University, 1954; M.D., 1958.

Joseph B. Kendis (Clinical Medicine), M.D., Washington University, 1933.

Robert R. Knowles, M.D. (M.B., B.S.), University of Sydney, 1947.

Jorge Kostianovsky, M.D., University of Litoral, Rosario Medical School, Argentina, 1959. (Malcolm Bliss)

Gary Kulak, M.D., University of Kansas, 1965. (Malcolm Bliss)

John B. Lewis (Medical Psychology in Child Psychiatry), B.S., Northwestern University, 1949; M.S.W., Washington University, 1952.

Jon Tek Lum, B.A., Brown University, 1959; M.D., Tulane University, 1963. (Malcolm Bliss)

Maria Lyskowski, M.D., University of Hamburg School of Medicine, 1949. (Malcolm Bliss)

Joe K. McKinney, B.A., Westminster College, 1954; M.D., Washington University, 1958.

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.

Jackson C. Neavles, A.B., Washington University, 1938; B.S. in Med. Sci., 1942; M.D., 1942.

Reese H. Potter, A.B., University of Kansas, 1931; B.S., University of Missouri, 1933; M.D., Washington University, 1935.

Thomas F. Richardson, B.A., Millikin University, 1959; M.D., Washington University, 1963.

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)

Abdallah A. Sabet, M.D., University of Tehran, 1960. (Malcolm Bliss)

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.

Harold D. Wolff, A.B., Washington University, 1952; B.S., University of Missouri, 1953; M.D., State University of Iowa, 1955.

Edwin D. Wolfgram, B.A., State University of Iowa, 1954; M.D., 1959.

Instructors Emeriti (Clinical)

Robert M. Bell, M.D., St. Louis University, 1928.

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

Research Instructors

Dorothy K. Baker (Social Work), B.A., Wartburg College, 1965; M.S.W., Washington University, 1967.

Robert Goldstein (Medical Psychology), B.A., City College of New York, 1954; Ph.D., University of Illinois, 1962. (Also College of Arts and Sciences)

William H. Holland (Electronics) A.B., Washington University, 1950. (See Department of Biological Chemistry.)

Cynthia L. Janes (Child Psychiatry) B.A., University of Oklahoma, 1965; Ph.D., 1969.

John K. Lescow (Child Psychiatry), B.A., Concordia Senior College, 1962; B.D., Concordia Seminary, 1966.

Theodore Reich, B.S., McGill University, 1959; M.D., 1963.

Research Instructors (Clinical)

Lois E. Franklin (Medical Psychology in Child Psychology), B.A., Blackburn College; M.A., MacMurray College, 1952.

Consultants

Eleanor T. Kenney (Medical Psychology), A.B., Bryn Mawr College, 1937.

Robert E. Lefton (Medical Psychology) A.B., Washington University, 1953; Ph.D., 1958.

Kathleen L. Lizama (Social Work in Child Psychiatry), B.A., Mundelein College, 1965; M.S.W., New York University, 1970.

Madeline Gonsky Pesanti (Social Work in Child Psychiatry), B.A., University of Illinois, 1967; M.A., University of Chicago, 1969.

SECOND YEAR

Introduction to Clinical Psychiatry. 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) criti-

cal evaluation of conceptual and methodologic problems in psychiatry and psychology. Lectures, demonstration interviews, discussions. (Dr. Murphy and Staff)

THIRD YEAR

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

(Drs. Woodruff, Tuason, and Staff)

FOURTH YEAR

Electives

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. Hudgens, Stewart, and Staff)

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

(Drs. E. Robins, Guze, Winokur, Murphy, L. Robins, and Staff)

Child Psychiatry. This course meets 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; hyperactive children; autism; examination of children with psychiatric problems; school phobia, fears, depression;

retardation and reading disability; treatments in child psychiatry; accident proneness, fire setting, stealing.

(Drs. Edwards, Stewart)

Neurochemistry. This course is 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.

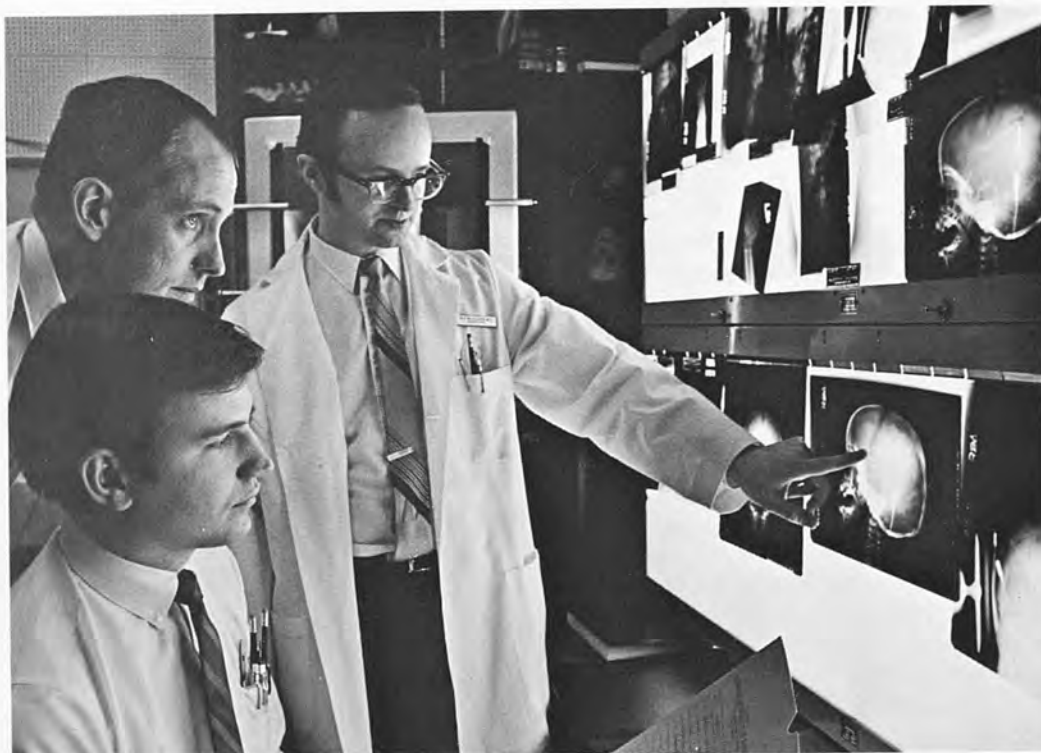
(Drs. McDougal, B. Moore)

Staff Conferences. Students are invited to attend certain of the psychiatric staff conferences held weekly at Malcolm Bliss Mental Health Center.

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)

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. John W. Fenlon

Cardiac Radiology

Dr. Nikolaus Schad

Musculoskeletal and Peripheral

Angiography

Dr. Tom W. Staple

Neuroradiology

Dr. Glenn Roberson

Nuclear Medicine

Dr. E. James Potchen

Pediatric Radiology

Dr. William McAlister

Pulmonary Radiology

Dr. S. David Rockoff

Radiation Therapy

Dr. William E. Powers, Director

Clinical Radiation Therapy

Dr. Carlos A. Perez

Cancer Biology

Dr. Frederick A. Valeriote

Radiation Therapy Physics

Dr. Arnold Feldman

Radiation Physics

Dr. Michel Ter-Pogossian

Radiation Biology

Dr. Leonard J. Tolmach

The Department of Radiology of Washington University, housed in the Edward Mallinckrodt Institute of Radiology, provides both diagnostic and therapeutic radiological services. It connects by corridor and tunnel with Barnes, St. Louis Children's, St. Louis Maternity, McMillan, Wohl, Barnard, and Renard Hospitals and the Washington University Clinics. In addition, laboratory facilities for research in radiation physics, radiation biology, radiation therapy, and ultrasound are housed in the Institute.

Four floors of the 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.

Clinical facilities for the Division of Radiation Therapy are located on the ground floor of the Institute and in Barnard Hospital. The equipment consists of a 24 Mev Betatron, a 4 Mev as well as an advanced 35 Mev linear accelerator, Cobalt 60 therapy and superficial X-rays. In addition, there are facilities and an ample stock of Cobalt 60 sources for both interstitial and intracavitary therapy. A section of cancer biology occupies half of the 7th and half of the 10th floors, providing for research laboratories for the staff as well as the trainees. A well equipped physics section includes a simulator, computerized treatment dosimetry, thermoluminescent dosimetry, and a film isodose plotter. 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 tenth 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.

Professors

William H. McAlister, B.S., Wayne State University, 1950; M.D., 1954. (See Department of Pediatrics)

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

William E. Powers, B.S., University of Illinois, 1949; M.D., 1951.

Nikolaus Schad, M.D., University of Munich, 1951; Privat Dozent, University of Zurich, 1967.

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. (See Department of Anatomy)

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)

Wendell G. Scott, A.B., University of Colorado, 1928; M.D., Washington University, 1932; Sc.D. (hon.), University of Colorado, 1954.

Consultants

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

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

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

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

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

S. David Rockoff, A.B., Syracuse University, 1951; M.D., Albany Medical College, 1955; M.S., University of Pennsylvania, 1961.

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

Teresa J. Vietti (Radiation Therapy), A.B., Rice University, 1949; M.D., Baylor University, 1953. (See Department of Pediatrics)

Michael J. Welch (Radiation Chemistry), B.A., Cambridge University (England), 1961; M.A., 1964; Ph.D., University of London, 1965. (Also College of Arts and Sciences)

Associate Professors (Clinical)

A. Norman Arneson, B.S., Texas Christian University, 1924; M.D., Washington University,

1928. (See Department of Obstetrics and Gynecology)

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

Assistant Professors

John O. Eichling (Radiation Physics), B.S., Northeastern Oklahoma State College, 1958; M.S., Oklahoma State University, 1959; Ph.D., Washington University, 1970.

Ronald G. Evens, B.A., Washington University, 1961; M.D., 1964.

Arnold Feldman (Radiation Physics), B.S., Pennsylvania State College, 1944; M.S., California Institute of Technology, 1948; Ph.D., University of Colorado, 1960.

John W. Fenlon, A.B., Washington University, 1958; M.D., 1962.

Michael E. Phelps (Radiation Physics), B.S., Western Washington State College, 1965; Ph.D., Washington University, 1970.

Glenn H. Roberson, B.S., Baylor University, 1962; M.D., University of Texas Southwestern, 1965.

Hildegard Schad, M.D., University of Tübingen Medical School (Germany), 1946.

Frederick Augustus Valeriote (Radiation Biology), B.S., University of Toronto, 1962; M.A., 1964; Ph.D., 1966.

Barbara Gibgot Weiss (Radiation Biology), B.A., Hunter College, 1959; Ph.D., Washington University, 1964.

Research Assistant Professors

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

Carleton C. Stewart (Radiation Biology), B.A., Hartwick College, 1962; M.S., University of Rochester, 1964; Ph.D., 1967.

Assistant Professors (Clinical)

William E. Allen, Jr., B.S., Howard University, 1927; M.D., 1930.

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

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

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

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

Assistant Professor Emeritus (Clinical)

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

Instructors

Robert P. Ainsworth, B.E., Yale University, 1962; M.D., Cornell Medical College, 1967.

John Stephen Bradfield, B.A., University of Texas, 1962; M.D., University of Texas, Southwestern Medical School, 1966.

Andrzej Demidecki (Radiophysics in Radiology), M.Sc., Warsaw University (Poland), 1956.

John V. Forrest, B.A., University of Notre Dame, 1962; M.D., State University of New York, Downstate Medical Center, 1966.

Albert E. Hesker, A.B., University of Missouri, 1961; M.D., University of Missouri Medical School, 1964.

Sheila Elsie Hodgson, M.D., Woman's Medical College of Pennsylvania, 1964.

Jeannie Jones Kinzie, B.S., Montana State University, 1961; M.D., Washington University, 1965.

Robert Cameron McKnight, M.D., Washington University, 1961.

Michael L. Matheny (Radiological Technology), B.S., St. Louis University, 1969.

Charles L. Robertson, B.S., University of Idaho, 1962; M.D., Washington University, 1966.

Robert Joseph Stanley, B.S., St. Peter's College, 1959; M.D., St. Louis University, 1963.

Research Instructors

Edward A. Puro (Radiation Biology), B.Sc., University of Toronto, 1962; M.A., 1966; Ph.D., 1970.

Palmer G. Steward, B.A., Haverford College, 1959; M.S., University of California, 1964; Ph.D., 1968.

Rebecca K. Studer, B.S., State Teachers College (Kirksville), 1964; M.S., Texas Christian University, 1966.

Instructors (Clinical)

Beauvoir H. Edmond, B.S., Lycee Petion (Haiti), 1949; M.D., University of Haiti Medical School, 1955.

G. W. Spector, B.A., Amherst College, 1954; M.D., Yale University, 1959.

Lecturers

Armand Diaz (Radiologic Technology), R.N., R.T., Havana University School of Medicine, 1948.

Ralph T. Overman (Nuclear Medicine), A.B., Kansas State College, 1939; M.S., 1940; Ph.D., Louisiana State University, 1943.

Research Assistants

Carole Ann Benbassat, B.S., Tufts University, 1968.

Maria Chraplyvy, M.S., St. Louis University, 1967.

Julius Hecht, A.B., Washington University, 1950.

Joanne Markham, B.A., Centre College, 1963.

Janet Eileen Morgan, B.A., Lindenwood College, 1969.

James H. Patterson, B.A., Lincoln University, 1955.

Sandra Jean Tolen, A.A., Belleville Jr. College, 1958.

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, and radiation biology.

Nuclear Medicine. A series of 24 lectures emphasizing the principles of the tracer method as applied to clinical medicine. The material includes means of obtaining and interpreting kinetic data and the application of such data to the pathophysiologic assessment of specific disease states. Emphasis is placed on the current status of radioisotopes in evaluating normal and pathologic clinical physiology as a transition between basic sciences and clinical medicine.

Cellular Radiation Biology. This course, which is offered as Molecular Biology 567 in the Graduate School, is concerned with cellular changes brought about by the absorption of ionizing and ultraviolet radiations. Emphasis is on mammalian cells, though other kinds of cells will be discussed as well. Particular attention is devoted to the loss of cell viability and modifications that can be made in this response by various agents.

FOURTH YEAR Electives

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 consists of exposure to the various divisions or sections within the Department (abdominal, thoracic, cardiovascular, musculoskeletal, pediatric, radiation therapy, nuclear medicine) one week at a time, but the program can be varied to suit individual requirements. These sessions include an introduction to the principles of film interpretation and the opportunity to observe fluoroscopy and special procedures. Therapy sessions include case presentation and clinical oncology. Each student's clinical rotation is customized and varies with his needs and interest. The formal teaching sessions, however, are more rigidly structured.

Clerkships in Subspecialties of Radiology. These clerkships are offered in nuclear medicine, radiation therapy, and the various subspecialties of diagnostic radiology.

(Drs. Fenlon, Roberson, McAlister,
Powers, Potchen, Schad)

The Mary Culver Department of Surgery



The Department of Surgery includes General Surgery, Plastic and Reconstructive Surgery, Orthopedic Surgery, Neurological Surgery, Genitourinary Surgery, Cardiothoracic Surgery, and Pediatric Surgery.

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 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 to attend and assist at operations upon patients assigned

to them. The physiology, pathology, chemistry, and bacteriology and pre- and post-operative care are stressed. Experience is acquired in surgical diagnosis and in the use of scientific methods that permit students 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 twelve weeks), (3) electives in 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, M.D., University of Pennsylvania, 1948.

Harry Edison Professor of Surgery

Arthur E. Baue, A.B., Westminster College, 1950; M.D., Harvard Medical School, 1954.

Professor

Harvey R. Butcher, Jr., A.B., Central College, 1941; M.D., Harvard University, 1944.

Professor (Clinical)

Eugene Myron Bricker, M.D., Washington University, 1934.

Lecturer

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

Associate Professors

John A. Collins, A.B., Fordham University, 1955; M.D., Columbia University, 1959.

William T. Newton, B.S., Yale University, 1947; M.D., 1950.

Jessie L. Ternberg, A.B., Grinnell College, 1946; Ph.D., University of Texas, 1950; M.D., Washington University, 1953.

Leslie Wise, B.S., University of Sydney; M.D., 1957.

Associate Professors (Clinical)

Robert W. Bartlett, B.S., University of Michigan, 1926; M.D., 1930.

Heinz Haffner, B.S., University of Arizona, 1931; M.D., Washington University, 1935.

Carl J. Heifetz, B.S., Washington University, 1927; M.D., 1929.

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.

Lawrence W. O'Neal, M.D., Washington University, 1946.

James M. Stokes, M.D., Washington University, 1948.

Associate Professors Emeriti (Clinical)

J. G. Probst, M.D., Loyola University, 1917.

Franklin E. Walton, B.S., Shurtleff College, 1923; M.D., Washington University, 1927; Sc.D. (hon.), Shurtleff College, 1952.

Assistant Professors

Alexander S. Geha, B.S., American University of Beirut, 1955; M.D., 1959.

Allen P. Klippel, A.B., Amherst College, 1944; M.D., St. Louis University, 1946.

Gordon W. Philpott, B.S., Yale University, 1957; M.D., Washington University, 1961. (American Cancer Society Advanced Clinical Fellow)

Mohammed M. Sayeed, (Surgical Physiology) B.S., Osmania University, 1956; Ph.D., University of Miami, 1964.

Granville J. Womack, B.S., Oklahoma City University, 1949; M.D., University of Oklahoma, 1952.

Assistant Professors (Clinical)

Cyril J. Costello, B.S., University of Texas, 1935; M.D., 1939.

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

Leo A. Sachar, A.B., Washington University, 1936; M.D., 1940.

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

William Shieber, M.D., Washington University, 1953.

Andrew D. Spencer, A.B., Indiana University, 1951; M.D., 1954.

George L. Tucker, A.B., Columbia University, 1952; M.D., Harvard University, 1956.

Willard B. Walker, M.D., Washington University, 1946.

George L. Watkins, Jr., A.B., Westminster College, 1938; M.D., Washington University, 1942.

Instructors

Charles B. Anderson, A.B., Johns Hopkins University, 1958; M.D., Yale University, 1962.

Robert C. Donaldson, A.B., University of Missouri, 1941; M.D., Washington University, 1944.

William L. Donegan, B.A., Yale University, 1955; M.D., 1959.

James R. Hurd, A.B., Princeton University, 1957; M.D., Harvard University, 1961.

Robert J. Kingsbury, A.B. Asbury College, 1956; M.D. University of Michigan, 1960.

George C. Wee, M.D., University of Louisville, 1931.

Instructors (Clinical)

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

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

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

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

Richard H. Fallon, B.S., Boston College, 1952; M.D., Harvard University, 1956.

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

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

G. Lynn Krause, Jr., A.B., Amherst College, 1950; M.D., University of Pennsylvania, 1954.

Jerome F. Levy, A.B., Washington University, 1954; M.D., 1958.

Robert H. Lund, M.D., Washington University, 1949.

Eugene N. Mitchell, B.S., St. Louis University, 1955; M.D., University of Missouri, 1960.

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

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

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

George B. Rader, M.D., Washington University, 1951.

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

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

Research Instructor

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

Assistants (Clinical)

Arthur I. Auer, B.S., Massachusetts Institute of Technology, 1952; M.D., Washington University, 1956.

Leslie F. Bond, A.B., University of Illinois, 1948; M.D., Meharry Medical College, 1952.

Katherine J. 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.

Frederick W. Klinge, A.B., University of Missouri, 1938; M.D., Washington University, 1942.

Stanley L. London, M.D., Washington University, 1949.

Samuel Lugo, B.S., St. Louis University, 1954; M.D., 1958.

Lester J. Nathan, B.A., University of Omaha, 1949; M.D., University of Nebraska, 1952.

Meredith J. Payne, A.B., Washington University, 1947; M.D., 1950.

Keith E. Pipes, A.B., Fresno State College, 1950; M.D., Washington University, 1954.

Robert Rainey, B.S., Yale University, 1944; M.D., Washington University, 1947.

Donald C. Sauer, A.B., Washington University, 1956; M.D., 1960.

Cardiothoracic Surgery

Professor

Clarence S. Weldon, A.B., University of Michigan, 1951; M.D., Johns Hopkins University, 1955.

Professor (Clinical)

Thomas H. Burford, A.B., University of Missouri, 1931; B.S. Med., 1933; M.D., Yale University, 1936.

Associate Professor (Clinical)

Thomas B. Ferguson, B.S., Duke University, 1943; M.D., 1947.

Assistant Professors

Richard E. Clark, B.S.E., Princeton University, 1957; M.D., Cornell University, 1960; M.S., University of Virginia, 1962.

Edmond E. Spaeth (Biomedical Engineering in Surgery), B.S., Stanford University, 1962; M.S., California Institute of Technology, 1963; Ph.D., 1967. (Also School of Engineering and Applied Science)

Assistant Professors (Clinical)

Martin Bergman, A.B., Washington University, 1942; M.D., 1945.

Charles L. Roper, A.B., Colorado College, 1949; M.D., University of Colorado, 1953.

Genitourinary Surgery

Professors

Saul Boyarsky, B.S., University of Vermont, 1943; M.D., 1946. (See Department of Pharmacology)

Justin J. Cordonnier, B.S., Washington University, 1926; M.D., 1928.

Professor Emeritus (Clinical)

Dalton K. Rose, M.D., Washington University, 1915.

Associate Professors (Clinical)

Morris Abrams, B.S., University of Illinois, 1934; M.D., 1937.

William T. Bowles, M.D., Stanford University, 1955.

Carl A. Wattenberg, A.B., University of Kansas, 1934; M.D., 1937.

Associate Professor Emeritus (Clinical)

Rogers Deakin, M.D., Washington University, 1922.

Assistant Professors

James G. Bucy, B.S., Haverford College, 1958; M.D., Northwestern University, 1962.

Peregrina N.C. Labay, B.S. (Ed.), University of St. Thomas, 1947; B.S. (Med.), 1949; M.D., 1954. (See Department of Anatomy)

Charles B. Manley, Jr., A.B., University of Missouri, 1955; M.D., 1958.

Assistant Professor (Clinical)

Robert K. Royce, B.S., University of Mississippi, 1939; M.D., Washington University, 1942.

Research Assistant Professor

Ovidio D. Escalante, B.S., University of El Salvador, 1957; M.D., 1960.

Instructors (Clinical)

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

M. Richard Carlin, B.A., Dartmouth College, 1944; M.D., Yale University, 1947.

Saul Klein, M.D., Syracuse University Medical Center, 1959.

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

Herbert Sunshine, A.B., Washington University, 1950; M.D., 1954.

Assistant (Clinical)

Jules H. Kopp, M.D., University of Arkansas, 1951.

Neurological Surgery

August A. Busch, Jr., Professor of Neurological Surgery

Henry G. Schwartz, A.B., Princeton University, 1928; M.D., Johns Hopkins University, 1932.

Professors

Sidney Goldring, M.D., Washington University, 1947.

James O'Leary (Experimental Neurological Surgery), B.S., University of Chicago, 1925; Ph.D., 1928; M.D., 1931. (See Department of Neurology)

Professor Emeritus (Clinical)

Leonard T. Furlow, B.S., Emory University, 1923; M.D., 1925.

Associate Professor

William S. Cox, B.S., Hampden-Sydney College, 1945; M.D., Johns Hopkins University, 1948.

Assistant Professor

Ralph A. W. Lehman, B.A., Harvard University, 1958; M.D., 1962.

Instructor

Mark P. Heilbrun, A.B., Brown University, 1958; M.D., University of Buffalo, 1962.

Orthopedic Surgery

Professors

Fred C. Reynolds, A.B., Washington University, 1931; M.D., 1934.

H. Relton McCarroll, A.B., Ouachita College, 1927; M.D., Washington University, 1931.

Associate Professors (Clinical)

Oscar P. Hampton, Jr., M.D., University of Tennessee, 1928.

Arthur H. Stein, Jr., A.B., Amherst College, 1946; M.D., Washington University, 1948.

Assistant Professors

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

Marshall B. Conrad, A.B., Westminster College, 1942; M.D., Washington University, 1945.

James C. Ellsasser, M.D., Washington University, 1964.

Joseph A. Kopta, B.S., University of Oklahoma, 1958; M.D., 1962; M.S. University of Illinois, 1970.

H. Relton McCarroll, Jr., A.B., Princeton University, 1958; M.D. Columbia University, 1962.

Ronald E. Rosenthal, M.D., Washington University, 1961.

Assistant Professors (Clinical)

Lee T. Ford, Jr., M.D., University of Tennessee, 1940.

Earl P. Holt, Jr., B.A., Duke University, 1942; M.D., 1945.

Robert E. Kuhlman, A.B., Washington University, 1953; M.D., 1956.

Milton I. Lenobel, B.S., New York University, 1935; M.D., 1939.

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.

Harry C. Morgan, B.A., University of Missouri, 1949; B.S., 1951; M.D., Harvard University, 1953.

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

Instructors (Clinical)

Vilray P. Blair, Jr., M.D., Washington University, 1939.

William S. Costen, A.B., Princeton University, 1950; M.D., Washington University, 1954.

Ronald C. Hertel, A.B., Washington University, 1952; M.D., 1956.

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

W. Edward Lansche, A.B., Washington University, 1948; M.D., 1952.

Stanley M. Leydig, B.A., Montana State University, 1930; M.D., Washington University, 1934.

Marvin Mishkin, M.D., University of Illinois, 1955.

Newton B. White, M.D., University of Cincinnati, 1957.

Assistants (Clinical)

John P. Arnot, B.A., Rice University, 1954; M.D., Yale University, 1958.

Alan H. Morris, M.D., University of Illinois, 1963.

Herman E. Russell, B.A., New York University, 1950; M.D., University of Geneva, 1956.

George R. Schoedinger III, M.D., University of Oregon Medical School, 1962.

Pediatric Surgery

Associate Professor

Jessie L. Ternberg, A.B., Grinnell College, 1946; Ph.D., University of Texas, 1950; M.D., Washington University, 1953.

Plastic and Reconstructive Surgery

Professor

Paul M. Weeks, A.B., Duke University, 1954; M.D., University of North Carolina, 1958.

Professor (Clinical)

Minot P. Fryer, A.B., Brown University, 1936; M.D., Johns Hopkins University, 1940.

Assistant Professor

Frederick L. Remark, A.B. Ohio Northern University, 1960; M.D., Ohio State University, 1964.

Assistant Professor (Clinical)

Marcy A. Goldstein, M.D., Washington University, 1951.

Consultant in Oral Surgery

Leroy W. Peterson, D.D.S., University of Michigan, 1940. (Also School of Dentistry)

Instructors (Clinical)

Joseph W. Eades, A.B., Amherst College, 1952; M.D., Washington University, 1960.

George H. Zografakis, M.S., Rutgers University, 1955; M.D., State University of New York, Upstate Medical College, 1959.

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 Wards. For twelve weeks the students serve as clerks in 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. Students are encouraged to consult the library frequently in the solution of problems concerning patients. One afternoon a week students participate in the tumor clinic and attend a tumor conference held jointly by the Departments of Surgery, Pathology, and Radiology. Students may attend a variety of other scheduled conferences conducted by the various divisions of the Department.

FOURTH YEAR

The electives offered senior students are principally clinical clerkships or research.

Surgical Seminar. An open-end student-oriented seminar in surgery is 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 sees patients in the physician's office, takes histories, performs physical examinations on the patients, and follows 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 are 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 gains 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 participates in the weekly departmental research seminars, where investigators describe current laboratory approaches to a wide variety of problems, and in the weekly surgical journal club, where are presented varying results of critical reading of current surgical publications, clinical and experimental.

(Dr. Ballinger and Staff)

Pediatric Surgery Elective. This elective consists of a clerkship on pediatric surgery. The emphasis is placed on the different

problems this age group presents in respect to type of surgical diseases and their care. In addition to the daily ward rounds, conferences are arranged twice a week to discuss the etiology, diagnosis, and treatment of disorders that have not been encountered on the ward. The student also attends the General Surgery Pediatric Clinic, where he participates in postoperative follow-up of patients. Once a week the student attends the Pediatric Oncology Clinic. Pertinent pediatric X-ray films are 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 the various tests of pulmonary function. A cardiac surgery patient may kindle interest in catheterization techniques, physiology of cardiopulmonary bypass, or a comparative evaluation of surgical methods. There are a number of regularly scheduled conferences and seminars the student may attend. In addition, 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.

(Dr. Weldon and Staff)

Plastic and Reconstructive Surgery Preceptorship. The aim of this elective is to familiarize the student with some of the problems in plastic and reconstructive surgery. The student has an opportunity to discuss the application of principles of tissue repair to a variety of surgical conditions, including burns and other forms of trauma, and major soft tissue injury associated with cancer surgery. There is a constant personal relationship between the student and the attending staff during the period.

(Dr. Weeks and Staff)

Orthopedic Surgery Elective. Clinical clerkship electives are available for six weeks, during which time the student attends conferences and outpatient clinics and serves in the various orthopedic clinical divisions. The Orthopedic Service does not have interns, and medical students electing this clerkship serve as an active and integral part of the team. The conferences that they are 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 include patient work-up, pre- and postoperative care, and attendance at selected neurosurgical operations. Daily morning rounds are held with a member of the attending staff. At these rounds a patient is presented and the disease entity discussed in detail. Students also work in the Neurosurgical Clinic and attend the weekly combined conference in neuropathology, neurology, and neurosurgery. In addition they attend the junior class Saturday morning lectures, which include patient presentation. (Dr. Schwartz and Staff)

Urology Elective. A six-week 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 of all patients on a particular service are conducted by the responsible resident. Two additional teaching rounds for the house staff and students

are held weekly. In addition, the student attends daily X-ray conferences, the weekly staff conference, and the pathology conference and journal club conducted every other week. The student is 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. Boyarsky 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.
(Dr. Ackerman)
2. Surgical Pathology of Gynecologic Neoplasms.
(Drs. Rosai, Lagos)
3. Neoplasms in Children. (Dr. Vietti)
4. Head and Neck Cancer. (Dr. Ogura)
5. Radiation Therapy of Neoplasms.
(Dr. Powers)
6. Hematologic Neoplastic Disease.
(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., first Monday of each month, September to June.

Each student taking an elective in oncology must select (or be assigned) a problem for study in the field. Each student is expected to report to his peers and instruc-

tors on the selected subject at the end of the elective period. Members of the Tumor Committee 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 its 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, including surgery, radiation therapy, 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 or is assigned by a member of the clinical staff. Training in the design of a clinical experiment and analysis of clinical data is coordinated 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)

Teaching and Research Divisions



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. LINC computers are available to students. Five Programmed Consoles, a smaller computer designed at

BCL, are also available and many computers of both types are connected by telephone lines to an IBM 360/50 at the Washington University Information Processing Center.

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. For other related courses see the Interdepartmental Program in Biomedical Engineering.

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 "macro-modules" from which arbitrary large, complex, or specialized computer systems can be assembled. These systems are being applied to several challenging problems in physiology and medicine.

*Professor and Director
of the Laboratory*

Jerome R. Cox, Jr., S.B., Massachusetts Institute of Technology, 1947; S.M., 1948; Sc.D., 1954. (See Department of Physiology and Biophysics) (Also School of Engineering)

Associate Professor

Donald L. Snyder, B.S., University of Southern California, 1961; M.S., Massachusetts Institute of Technology, 1963; Ph.D., 1966. (Also School of Engineering)

Assistant Professors

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. (Also School of Engineering)

Lewis J. Thomas, Jr., B.S., Haverford College, 1953; M.D., Washington University, 1957. (See Departments of Physiology and Biophysics and Anesthesiology)

Research Assistant

Michael D. McDonald, B.S., St. Louis University, 1957.

Assistant Director for Engineering

Vernon W. Gerth, Jr., B.E., Vanderbilt University, 1960; M.S., 1964.

Administrative Officer

Edward L. MacCordy, B.S., Tufts University, 1947; M.S., Rensselaer Polytechnic Institute, 1957. (Computer Systems Laboratory)

Elective Courses

512. 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. Credit 2 units. (Dr. Holmes)

Topics in Biomathematics. A computer-based course reviewing topics from calculus (logic and set theory, differentiation, integration, differential equations) with emphasis on the mathematics required in the formulation of kinetic models for physiological systems. Students learn to program the IBM 360/50 in the BASIC language (for which there is a teletypewriter terminal at BCL) and also use a smaller computer (PDP-12) with interactive graphical capabilities to develop an intuitive understanding of particular models from physiology and biochemistry. Two class hours a week.

(Dr. Rockoff)

AMCS 525. Compartmental Analysis. A critical study of some methods currently in use for the analysis of isotope tracer data from physiological and other intact systems. Students work in teams with graduate students in engineering to analyze real data. Topics covered are: assumptions for tracer studies, differential equation formulation, fitting data with linear combinations of exponentials, integral equation formulation, relationship to network theory. Topics in Biomathematics or equivalent mathematical preparation required. Three class hours a week. Credit 3 units. (Dr. Rockoff)

Programming Techniques for Laboratory Computers. Topics covered are generalized description of logical design of digital computers; decimal, octal, and binary number systems; machine language programming for the LINC; usage and design of algorithms for programming. Three hours of class work plus laboratory each week for a period of six weeks. (Mr. M. McDonald)

Note—The number preceding the course title indicates that the course carries credit in the Graduate School of Arts and Sciences or in the Sever Institute and may be found under that number in the Bulletin of the appropriate School.

INTERDEPARTMENTAL PROGRAM IN BIOMEDICAL ENGINEERING

This course of graduate study is designed to provide education and training for students wishing to apply principles of modern engineering and mathematics to theoretical and practical problems in biology and medicine. Participating in the Program are students and faculty of both the School of Engineering and Applied Science and the School of Medicine.

Every student seeking an advanced degree in engineering must be admitted to one of the participating departments of the Sever Institute of Technology, the graduate division of the School of Engineering and Applied Science. The Program permits the student to earn both the M.D. and the M.S. or D.Sc. degrees in conjunction with the Medical Scientist Training Program or other programs in the School of Medicine. Students not candidates for a degree are welcome to take courses as electives.

Graduate study plans are tailored to the individual's needs and interests, and provide essential background in the related areas of life and medical sciences. Students with diverse undergraduate backgrounds may be admitted provided they have adequate preparation and experience in mathematics and the physical sciences. Areas of specialization include sensory communications, electrocardiography, flow and diffusion in biological systems, electrobiology, technology in health care, biomedical statistics, modeling biological systems, engineering of artificial organs, urodynamics, and applications of advanced computer techniques to biology and medicine. Research facilities available to the Program are located in the School of Engineering and Applied Science, the School of Medicine, and the Washington University Computer Laboratories. The faculty includes representatives from the Biomedical Computer Laboratory, the Departments of Biological Chemistry, Physiology and Biophysics, Preventive Medicine and Public Health, Radiology, Surgery, and Anatomy

in the School of Medicine; and the Departments of Applied Mathematics and Computer Science, Chemical Engineering, Electrical Engineering, and Mechanical Engineering in the School of Engineering and Applied Science.

Complete course listings and information about application and degree requirements may be found in the Bulletin of the School of Engineering and Applied Science.

Faculty

Professor Russell R. Pfeiffer, Chairman; Professors M. Cowan, J. Cox, T. Sterling, M. Ter-Pogossian, R. Vagelos, R. Wette, S. Sutura; Associate Professors R. Hochmuth, C. Molnar, W. Pickard; Assistant Professors R. Arthur, R. Clark, G. Little, M. Rockoff, E. Spaeth, S. Weinberg; Staff Associate H. Bomze

BMed 600. *Research for doctoral dissertation.*

BMed 644. *Surgical Techniques for Biomedical Experimentation.* A course of instruction in aseptic surgical techniques necessary for basic experimental applications. Topics covered are: chronic surgery, implant techniques for telemetry and monitoring agents; the humane care, handling, and housing of animals; choice and induction of anesthesia; techniques of ligation, suturing, and cannulation; use of respirators, gas analyzers, and other associated instruments. Permission of instructor required. One class hour and four laboratory hours a week. Credit 3 units.

BMed 660. *Biomedical Applications of Laboratory Digital Computers.* Introduction to the use of digital computers in the laboratory. Considerations in the choice of computer equipment and algorithms for the solution of laboratory and clinical problems. Examples of applications in data gathering and processing, control of experiments, modeling and simulation. Prerequisite, Electrical Engineering 460, Applied Mathematics and Computer Science 132, or permission of instructor. Credit 3 units.

BMed 675. *Mathematical Methods in Physiology.* Application of analytical technique to the solution of problems in engineering physiology. Irreversible thermodynamics of living systems; subcellular physiology; cellular neurophysiology; structure and function of muscle; circulatory dynamics; respiration; kidney; systems theory in biology. Prerequisite, advanced calculus; corequisite, Biology 401 or Physiology 502.

BMed 693. *Special Topics in Biomedical Engineering.* Individual or group instruction, by members of the faculty, devoted to topics not covered in the formal courses. Topics chosen from mechanics of the musculo-skeletal system and human body kinetics; mechanics of the cardiovascular system; biomedical instrumentation; etc. Hours and credit to be arranged.

Other Biomedical Engineering course offerings:

BMed 545. *Hospital Electrical Systems and Monitoring Instrumentation*

BMed 546. *Engineering of Artificial Organ Systems I: Fluid Flow*

BMed 547. *Engineering of Artificial Organ Systems II: Mass Transfer*

BMed 548. *Engineering of Artificial Organ Systems III: Mechanics*

BMed 560. *Introduction to Biomechanics*

BMed 573. *Electrobiology*

BMed 576. *Sensory Communications*

BMed 578. *Biological Control Mechanisms*

For additional related courses, see Biomedical Computer Laboratory in this Bulletin and the Bulletin of the School of Engineering and Applied Science.

INTERDEPARTMENTAL PROGRAM IN NEUROBIOLOGY

The graduate program in Neurobiology leads to the degree of Doctor of Philosophy. Participating are the departments of Anatomy, Biology, Neurology, Ophthalmology, Otolaryngology, Pathology, Physiology and Biophysics, Psychiatry, Psychology, and Surgery; the School of Engineering and Applied Science; the Washington University Computer Laboratories; and Central Institute for the Deaf.

The program of study is adjusted to the particular aims of individual students, and includes investigations into the organization and function of the nervous system, such 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; 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.

Because of the diversity of the study and research programs, students of such varied fields as biology, chemistry, physics, psychology, mathematics, and engineering, and graduates of schools of medicine, veterinary medicine, and dentistry may be admitted.

It is recommended that during the first two years all neurobiology students take courses in biochemistry (Biological Chemistry 503), microscopic anatomy (Anatomy 503), neural sciences (Anatomy 504 and Physiology 504), and in one of the following: physiology, pathology, pharmacology, biology, microbiology, or a behavioral science, e.g., psychology. A list of acceptable courses is maintained by the Executive Secretary. In addition, all students are required to attend the seminar course Current Topics in Neurobiology for at least one year (preferably for two years). Further course work is left to the discretion of the individual with the approval of the Administrative Committee.

Administrative Committee

Professor A. I. Cohen, Chairman; Professor Eliasson, Executive Secretary; Professors Cowan, J. R. Cox, Eldredge, Enoch, S. Goldring, Hamburger, Hunt, Landau, Levi-Montalcini, O. Lowry, O'Leary, Pfeiffer, E. Robins, Sandel, Stern, Torack; Associate Professors McDougal, Molnar, Prensky, W. Sherman, Thalmann; Assistant Professor Schlaepfer.

Interested students should consult the Executive Secretary, Committee on Neurobiology, Washington University School of Medicine.

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 Walk-In Clinic 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. 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 Institutes of Health. Fellows in Child Psychiatry with special research interests can participate in the various research programs.

Director and Blanche F. Ittleson Professor

E. James Anthony, B.S., University of London, 1938; M.R.C.S., L.R.C.P., 1941; M.B., B.S., 1942; D.P.M., 1947; M.D., 1949.

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 College of Arts and Sciences)

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)

Research Assistant Professors

Boaz Kahana (Medical Psychology), B.A., Yeshiva University, 1955; M.S., 1957; Ph.D., University of Chicago, 1966.

Manon McGinnis (Psychiatric Social Work), B.A., Westhampton College, 1927; M.S.W., Pennsylvania School of Social Work, 1929.

Consultants

Eleanor T. Kenney (Medical Psychology), A.B., Bryn Mawr College, 1937; Ph.D., Washington University, 1964.

Robert E. Lefton (Medical Psychology), A.B., Washington University, 1953; Ph.D., 1958.

Instructors

Adele Feldman (Psychiatric Social Work), B.A., New York University, 1945; M.S.W., University of Denver, 1957.

Douglas R. Gowler (Child Psychiatry), M.D., Manitoba Medical College, 1948.

Nancy C. Kurtz (Psychiatric Social Work), B.A., University of Cincinnati, 1958; M.S.W., Ohio State University, 1968.

Nancy Jane Lowe (Medical Psychology), Ph.B., University of Chicago, 1947; M.A., 1950; Ph.D., Washington University, 1970.

Janet S. Portell (Psychiatric Social Work), B.A., Southern Illinois University (Edwardsville), 1965; M.S.W., Washington University, 1967.

Adolfo E. Rizzo (Child Psychiatry), M.D., Buenos Aires University, 1955.

Eve Love Sutton (Psychiatric Social Work), B.A., University of Kentucky, 1957; M.S.W., St. Louis University, 1964.

Marylyn Voerg (Medical Psychology), B.A., University of Florida, 1950; Ph.D., 1964.

Instructor Emeritus and Lecturer

Louetta Berger (Psychiatric Social Work), B.S., University of Wichita, 1941; M.S.W., Washington University, 1946.

Instructors (Clinical)

Doris C. Gilpin (Child Psychiatry), B.S., Drury College, 1944; M.D., University of Chicago School of Medicine, 1948.

John B. Lewis (Medical Psychology), B.S., Northwestern University, 1949; M.S.W., Washington University, 1952.

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)

Research Instructors

Lois E. Franklin (Medical Psychology), B.A., Blackburn College, 1950; M.A., MacMurray College, 1952.

Cynthia L. Janes (Medical Psychology), B.A., University of Oklahoma, 1965; Ph.D., 1970.

John K. Lescow (Psychiatric Social Work), B.A., Concordia Senior College, 1962; B.D., Concordia Seminary, 1966; M.S.W., Washington University, 1968.

Assistants

Kathleen L. Lizama (Psychiatric Social Work), B.A., Mundelein College, 1965; M.S.W., New York University Graduate School of Social Work, 1970.

Madeline G. Pesanti (Psychiatric Social Work), B.A., University of Illinois, 1967; M.A., University of Chicago, 1969.

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. (See Department of Medicine)



DIVISION OF HEALTH CARE RESEARCH

The Division of Health Care Research of the Washington University School of Medicine is an extradepartmental unit of the School, directly responsible to the Dean. Staff members hold appointments in a variety of departments of the School of Medicine and the University; indeed, broad multidisciplinary staffing is considered appropriate for address to the complicated sociomedical and economic problems of health care and education. The primary function of the divisional staff is to contribute to the solution of such problems. As such, its responsibilities include:

1. *Experimental Programs in Medical Care.* One experiment now under way is a small group practice conducted within the present Washington University Clinics facility. Known as the Medical Care Group of Washington University, it cares for 500 families. The group is staffed by pediatricians, internists, and obstetricians on the Washington University faculty, and utilizes for all other medical services existing

specialty groups within the Medical Center. One important objective of the practice is the evaluation of an experimental health insurance plan for ambulatory care.

2. *Health Care Planning, Ambulatory Services, Washington University Medical School and Associated Hospitals.* The Division of Health Care Research conducts studies to provide a factual basis for planning improvements in the use of ambulatory medical facilities of the center. In this way it is hoped that more effective medical care can be achieved.

3. *Research in Health Care.* Studies of several broad areas are conducted by the staff of the Division, including investigations into effects of various methods of practice on medical care costs, factors in the organization of medical care, studies of triage in emergency rooms, sociologic aspects of medical care, and methods of education for comprehensive care.

4. *Medical and Paramedical Education.* Educational activities include the collection and cataloguing of literature related to medical care for the library of the Division,



the provision of elective courses for medical students and graduate students of hospital administration, planning for clinical training in comprehensive medical care, plus the integration of training experience in comprehensive care with in-hospital programs in the classical specialties of medicine. The program for training pediatric nurse practitioners (PNP) is described on page 134.

Director

Gerald T. Perkoff, M.D., Professor of Medicine and of Preventive Medicine and Public Health.

Associates

Samuel D. Soule, M.D., Professor of Clinical Obstetrics and Gynecology.

Bernard Garfinkel, M.D., Associate Professor of Clinical Medicine.

Morris Alex, M.D., Assistant Professor of Clinical Medicine.

Lawrence I. Kahn, M.D., Assistant Professor of Pediatrics; Director, Program for Pediatric Nurse Practitioners.

Laurence E. Maze, M.D., Assistant Professor of Clinical Obstetrics and Gynecology.

Robert S. Mendelsohn, M.D., Assistant Professor of Clinical Medicine.

James Swift, Ph.D., Assistant Professor of Sociology.

M. Frances Watson, M.S.W., Assistant Professor of Social and Environmental Studies in Preventive Medicine.

M. Anita Whitney, Ph.D., Assistant Professor of Health Service in Preventive Medicine (Communications).

Arnold M. Goldman, M.D., Instructor in Clinical Medicine.

Maurice J. Lonsway, Jr., M.D., Instructor in Clinical Pediatrics.

Stanley B. Lyss, M.D., Instructor in Clinical Pediatrics.

Frederick D. Peterson, M.D., Instructor in Clinical Pediatrics.

Harold G. Russell, M.D., Instructor in Clinical Medicine.

Gerald Wool, M.D., Instructor in Clinical Pediatrics.

Nancy Quigley, Assistant in Health Services in Pediatrics.

Susan K. Keating, Assistant in Health Services in Pediatrics.

Assistants

Margaret Strand, Statistical Assistant.

Helen Floyd, Statistical Assistant.

Participating Faculty

James O. Hepner, Ph.D., Assistant Professor and Director, Graduate Program in Health Care Administration.

DIVISION OF TUMOR SERVICES

The Division of Tumor Services was organized as a coordinating committee for the Cancer Teaching Program. Inasmuch as cancer, like other subjects in the medical curriculum, is given in an interdepartmental manner, the Tumor Clinic is the principal site on which these Services function. Using the Tumor Clinic facility, an attempt is made to supplement and coordinate 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 firsthand 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 Radiation Therapy, Hematologic Neoplastic Disease and the Epidemiology of Cancer.

*Cancer Coordinator, Director of Division,
and Chairman of the Executive Committee*

Harvey R. Butcher, Jr.

Executive Committee

Edward Reinhard

Internal Medicine

H. Marvin Camel

Obstetrics and Gynecology

Joseph Ogura

Otolaryngology

Lauren Ackerman

Pathology

Teresa Vietti

Pediatrics

William Powers

Radiology

BEAUMONT-MAY INSTITUTE OF NEUROLOGY

The Beaumont-May Institute of Neurology was established in 1955 by gifts from the Louis D. Beaumont Foundation, the late Mrs. Charles M. Rice, and the late Morton J. May. It is the purpose of the Institute to foster basic and clinical research in neurology with special reference to defects in the structure of the nerve cell which occasion important neurological disorders having a high incidence of prolonged disability.

THE IRENE WALTER JOHNSON INSTITUTE OF REHABILITATION

The teaching of rehabilitation is conducted in all four years of the curriculum by the Department of Preventive Medicine and Public Health 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, 1957. (See Departments of Medicine and Preventive Medicine and Public Health)

*Associate Director for Education
and Administration*

Lorraine Lake, B.S., Washington University, 1950; M.A., 1954; Ph.D., 1962. (See Department 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 is given by means of informal lectures, demonstrations, and seminars.

Senior Elective. The elective in physical disability and rehabilitation is of six-weeks' duration. The student becomes familiar at first hand with the techniques for defining the extent of physical disability and with various approaches to its treatment. Emphasis is 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)

Allied Health Professions

Programs are conducted by the School in Health Care Administration, Occupational Therapy, Physical Therapy, Radiologic Technology, and for Pediatric Nurse Practitioners. All courses are approved by the American Medical Association or other certifying agencies, and graduates qualify for certifying examinations. For further information write to the director or educational director listed under the particular program, 660 South Euclid Avenue, St. Louis, Missouri 63110.

GRADUATE PROGRAM IN HEALTH CARE ADMINISTRATION

The Washington University Graduate Program in Health Care Administration is composed of the Program in Hospital Administration and the Program in Comprehensive Health Planning.

Program in Hospital Administration

The program was established in 1946 and is fully approved by the National Accrediting Commission on Graduate Education for Hospital Administration. It is one of a few hospital and health administration programs that has its locus in a medical school, thus affording students an opportunity to mingle with students of medicine and allied professions with whom the hospital and health administrator will be predominantly associated throughout his career. The program also offers opportunities for interdisciplinary integration with the Graduate School of Arts and Sciences and the Graduate School of Business Administration.

The primary goal is to prepare administrators for careers as generalists, with the aim that they will eventually function in leadership roles.

The twenty-one month sequence, consisting of twelve months of on-campus academic study and a nine-month in-hospital administrative residency, leads to the degree Master of Health Administration.

Program in Comprehensive Health Planning

The Program was initiated in July, 1969, with the help of a five-year grant from the U. S. Department of Health, Education and Welfare. The primary goal is to prepare managers/planners to assume leadership roles to effect changes in an orderly manner through community planning.

The twenty-one month interdisciplinary academic sequence, with a practicum during the summer between the first and second years, leads to the degree Master of Health Administration.



Assistant Professor and Director

James O. Hepner, B.A., University of Iowa, 1955; M.H.A., Washington University, 1959;; Ph.D., University of Iowa, 1964.

Instructor and Associate Director

Robert J. Nelson, A.B., Washington University, 1957; M.H.A., 1967.

Professor Emeritus

Frank R. Bradley, M.D., Washington University, 1928; LL.D., Central College, 1943.

Assistant Professor

David A. Gee, B.A., DePauw University, 1949; M.H.A., Washington University, 1951.

Instructors

David S. Luecke, B.A., Concordia Senior College, 1962; B.D., Concordia Seminary, 1967; M.B.A., Washington University, 1969; Ph.D., 1971.

Collin C. Rorrie, Jr., B.A., Beloit College, 1964; M.A., University of Iowa, 1966; Ph.D., 1968.

Lecturers

Rodney M. Coe, B.S., Iowa State University, 1955; M.A., Southern Illinois University, 1959; Ph.D., Washington University, 1962.

Harry E. Davis, Jr., B.S., St. Bonaventure University, 1950; M.H.A., Washington University, 1961.

Paul R. Donnelly, B.M.Ed., American Conservatory of Music, 1951; M.S., Northwestern, 1957.

Harold Hinderer, B.A., College of St. Thomas, 1952.

Donald J. Horsh, B.S.B.A., University of Nebraska, 1941; M.H.A., Washington University, 1951; J.D., St. Louis University, 1953.

William A. Kamman, B.S.I.E., Washington University, 1958.

Herbert E. Metz, B.A., City College of New York, 1942; M.A., University of Iowa, 1947.

Robert A. Parker, B.S., Arkansas State University, 1958; M.P.H., University of North Carolina, 1962.

Linn B. Perkins, B.A., Amherst College, 1949; M.H.A., Washington University 1951.

James W. Polkinghorn, B.A., University of Kansas, 1937.

Paul H. Wunderlich, B.A., Valparaiso University, 1962; M.H.A., Washington University, 1967.

Assistant Professors (Adjunct)

Robert E. Frank, B.S., St. Louis University, 1950; M.H.A., 1962.

Crofford O. Vermillion, B.A., DePauw University, 1939; M.D., Washington University, 1947.

Instructors (Adjunct)

Robert E. Adams, B.S., University of Nebraska, 1941; M.S., 1947; Ph.D., 1950.

Lavaughn A. Boldt, B.S.B.A., University of Nebraska; M.H.A., Washington University, 1961.

Ted Bowen, B.S., Austin College, 1941; M.H.A., Washington University, 1948.

James A. Canedy, B.A., Hastings College, 1950; M.H.A., Washington University, 1952.

Donald W. Cordes, A.B., Hope College, 1940; M.A., University of Michigan, 1941.

Paul A. Donnelly, B.A., University of New Hampshire, 1960; M.P.H., Cornell University, 1962.

John R. Eckrich.

Thomas W. Fourqurean, B.B.A., Texas College of Arts and Industries, 1939; M.B.A., University of Chicago, 1949.

Joe S. Greathouse, Jr.; B.S., University of Kentucky, 1951; M.S., Northwestern University, 1957.

James D. Harvey, B.A., University of South Dakota, 1950; M.H.A., University of Minnesota, 1952.

Thomas L. Hawkins, Jr., M.D., Albany Medical College of Union University, 1953.

David H. Hitt, B.S., University of Alabama, 1949; University of Minnesota, 1952.

Duane T. Houtz, B.A., University of Kansas, 1955; M.H.A., Washington University, 1960.

Lemuel R. Jordan, B.A., Amherst College, 1947; M.A., Columbia University, 1949.

Stephen M. Morris, B.B.A. Southwestern University, 1952; M.H.A., Washington University, 1954.

Richard D. O'Hallaron, B.S., St. Louis University, 1952; M.H.A., 1957.

Boone Powell, LL.D., Baylor University, 1958.

Sister Mary Roch Rocklage, B.S., St. Xavier College, 1961; M.H.A., St. Louis University, 1963.

Claire F. Ryder, A.B., Radcliffe College, 1940; M.D., Tufts College of Medicine, 1944; M.P.H., Harvard University, 1952.

Glenn H. Scott, B.A., Oklahoma Baptist University, 1956; M.H.A., Washington University, 1962.

Gail L. Warden, A.B., Dartmouth College, 1960; M.H.D., University of Michigan, 1962.

Participating Faculty

Jack Botwinick, Ph.D., New York University, 1953, Professor of Psychology.

David B. Carpenter, Ph.D., University of Wisconsin, 1951, Professor of Sociology.

Gerald Gutenschwager, Ph.D., University of North Carolina at Chapel Hill, 1969, Associate Professor of Architecture.

Raymond L. Hilgert, D.B.A., Washington University, 1963, Professor of Management.

Phillip T. May, Jr., Ph.D., C.P.A., University of Wisconsin, 1966, Associate Professor of Accounting.

Carl A. McCandless, Ph.D., University of Iowa, 1942, Professor of Political Science.

Powell Niland, D.C.S., Harvard University, 1953, Professor Management.

Walter R. Nord, Ph.D., Washington University, 1967, Assistant Professor of Organizational Psychology.

Joseph W. Towle, Ph.D., Northwestern University, 1948, Professor of Management.

Gilbert R. Whitaker, Jr., Ph.D., University of Wisconsin, 1961, Professor of Business Economics.

The curriculum leading to the M.H.A. degree consists of a sequence of required courses and elective study.

HCA 510. *Statistics for Health Care.* Introduction to statistics, with emphasis on professional managerial statistics for health agencies and hospitals. Credit 3 units.

(Staff)

HCA 520. *Electronic Data Processing.* Operating principles of computers, programming, fundamentals of computer languages and internal systems, as viewed by management. Credit 3 units.

(Staff)

HCA 530. *Research Methodology* (required). Introduction to research methods in the area of health care administration. Specific emphasis on formulation of a research problem, specifications of hypothesis, instrumentation formulation, data gathering, analysis of data, and an accepted thesis proposal. Credit 3 units.

(Dr. Rorrie)

HCA 540. *Organizational Theory* (required). Concepts and theories of management applicable to complex large-scale organizations. Social psychology of organizations and organizational stress and conflict, as related to the health care environment. Credit 3 units.

(Dr. Luecke)

HCA 541. *Hospital Management* (required). Organizational aspects of the operation of a general acute hospital; history of the hospital; role of the board of trustees, medical staff, house staff, administrator; components of patient care, hospital controls, and criteria; function of hospital departments, such as admitting, nursing, purchasing, clinical laboratories, pharmacy, medical records. Credit 3 units.

(Mr. Gee, Dr. Rorrie)

HCA 543, 544. *Financial Management for Hospitals* (required). 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 payors and the accounting aspects of purchasing. Credit 3 units each semester. (Mr. Hinderer)

HCA 545. *Organizational Behavior* (required.) Attitudinal change, structure and behavior in organizations. Managerial decision-making and problem-solving through analysis of an organization. Personnel administration and leadership development. Credit 3 units. (Dr. Luecke)

HCA 550. *Medical Care Administration* (required). Course deals with all kinds of public and private health agencies, and with the structure and organization of health services, their costs, and methods of financing. Journal papers are written and presented. Case studies are also used. Credit 3 units. (Dr. Hepner)

HCA 560. *Group Dynamics* (required). Conference and discussion techniques for both leaders and participants. Conference direction, including preparation of agenda, pre-conference organization, parliamentary procedure, and committee techniques. Credit 2 units. (Mr. Metz)

GBA 560. *Introductory Accounting Concepts* (required). Business organization, operations, and terminology. A survey of the broad area of accounting, including its mechanism. Intensive study of balance sheet, income statement, and other financial reports, together with the accounting principles underlying them. Analysis of statements designed for stockholders and creditors. Credit 3 units. (Dr. May)

HCA 561. *Persuasion* (required). A systematic examination of methods of argumentation aimed at improving the ability to persuade others. Credit 2 units. (Mr. Metz)

HCA 570. *Seminar in Health Care Delivery.* Senior medical students and health care administration students investigate aspects of health care delivery in low-income communities. Each student presents his study at a seminar. Credit 1 unit.

(Dr. Perkoff)

HCA 575. *Health Care Delivery Systems.* Course provides the student with an understanding of foreign health care systems, with particular emphasis on those fundamentals having applicability to our own system. Students are required to make an in-depth study of one particular system. The course is team taught by members of the full-time faculty and visiting professors. Credit 2 units. (Staff)

HCA 580, 581. *Comprehensive Health Planning* (required). A study of social process directed toward the improvement of the health system by allocating scarce resources for provision of health care in the community. Problem solving and case studies as related to community health problems. Utilization of theoretical tools in analyzing problems, determining alternatives, and defining feasible solutions. Credit 3 units each semester. (Mr. Nelson)

HCA 582, 583. *Comprehensive Health Planning Seminar* (required). Review and discussion of political, economic, sociological, and legal aspects of comprehensive health planning. Graduate students act as discussion leaders. Students develop models for comprehensive health planning. Credit 3 units each semester. (Mr. Nelson)

HCA 585. *Preventive Medicine and Public Health.* Emphasis is on the relative significance of the specific causes of physical and mental diseases within the framework of multiple etiological and environmental factors. Study of epidemiology as an aid in the diagnosis prognosis, and prevention of disease. Credit 3 units. (Staff)

HCA 590. *Health Care Legislative Process* (required). Essentials of the law in hospital administration. 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. Recent legislation is surveyed along with the legislative process as it pertains to health. Credit 3 units. (Staff)

HCA 600, 601, 602. *Independent Study* (thesis). Credit to be arranged. (Staff)

HCA 610, 611. *Clinical Practicum in Hospital and Health Administration* (required). Opportunity to observe and possibly implement, under clinical faculty supervision, the principles learned in the prerequisite academic sequence. Credit 2 units. (Preceptors)

Applicants are required to have a bachelor's degree from an accredited university or college acceptable to Washington University. The aptitude test of the Graduate Record Examination is required of all applicants.

Tuition: Hospital Administration

Per semester (three semesters).....	\$1,125
Residency (nine months).....	420

Tuition: Comprehensive Health Planning

Per semester (four semesters).....	1,125
Summer practicum.....	210

Books and supplies (per semester)	50-75
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Application fee (nonrefundable).....	15
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Some financial aid is available. (See page 28.)

PROGRAM FOR PEDIATRIC NURSE PRACTITIONERS

Director

Lawrence I. Kahn, M.D. Assistant Professor of Pediatrics; Associate, Division of Health Care Research.

Assistant Director

Stanley B. Lyss, M.D. Instructor in Clinical Pediatrics; Associate, Division of Health Care Research.

The School of Medicine, through the Department of Pediatrics and the Division of Health Care Research, has established a program for training Pediatric Nurse Practitioners. It encompasses a period of eight months beginning in September of each year. This Program was developed to help meet the challenge of expanded health services needed by the pediatric community and to provide nurses with an opportunity to extend the range and depth of their skills. The curriculum is divided into a four-month didactic period, followed by a four-month period of field training. The instruction is centered at the St. Louis Children's Hospital and the Division of Health Care Research. Other resources of the Medical Center, the city, and the offices of private pediatricians are utilized. The major portion of the instruction is provided by the Department of Pediatrics.

The Pediatric Nurse Practitioner (PNP) is a registered nurse whose special training enables her to play a larger role in providing pediatric services. She obtains histories, performs physical examinations, and appraises physical, psychological, and intellectual growth and development. She is competent to counsel families in matters concerning nutrition, accident prevention, and child rearing. With the physician she

participates in the management of acute and chronic illnesses.

Applicants must be registered nurses. A B.S. degree in nursing from an accredited program and experience in pediatrics are preferred but not required. On completion of training, the PNP is qualified to serve anywhere in the country where pediatric services are offered. The Program complies with the guidelines for such training as proposed by the American Academy of Pediatrics.

Tuition (eight months).....\$1,760

PROGRAM IN OCCUPATIONAL THERAPY

Assistant Professor and Elias Michael Director

Martha E. Matthews, A.B., Winthrop College 1933.

Assistant Professor and Associate Director

Elizabeth Withers, B.S., Memphis State University, 1957; M.A., 1959.

Assistant Professors

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.

Lecturers

Pauline Goetz.

Shirley Sahrman, B.S., Washington University, 1959.

Gene Speckert, B.S., Washington University, 1944.

Applicants must present sixty semester hours of college credit, including a specified number of units in English, biology, physical science, psychology, and sociology.

The degree of Bachelor of Science in Occupational Therapy is conferred upon the completion of three academic semesters at the School of Medicine and seven months of supervised clinical practice with both children and adults. 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 prevocational media and of how these are correlated therapeutically to provide desired treatment is 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 neuroanatomy; clinical subjects such as general medicine, neurology, 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.

Tuition (three semesters), per semester\$1,100
Tuition (7-month clinical period).... 750



PROGRAM IN PHYSICAL THERAPY

Assistant Professor and Director

Beatrice F. Schulz, B.S., Washington University, 1949; M.A., 1955.

Assistant Professor and Assistant Director

D. LaVonne Jaeger, B.S., University of Minnesota, 1951; M.A., Washington University, 1966.

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 T. Hickock, B.S., Washington University, 1953.

Lecturers

Michael L. Barton, B.A., Southern Illinois University, 1965; Ph.D., Washington University, 1969.

Barbara Nash, B.S.P.T., Washington University, 1949. (See Department of Preventive Medicine and Public Health)

Patricia R. Pickett, B.S.N., Western Reserve University, 1959. (See Department of Preventive Medicine and Public Health)

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 sci-

ences, 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.

Tuition (three semesters), per semester \$1,100
Tuition, final clinical semester 750

PROGRAMS IN RADIOLOGIC TECHNOLOGY

Educational Director and Lecturer in Radiologic Technology

Armand Diaz, R.N. and R.T., Havana University School of Medicine, 1948.

The Department of Radiology, which has its headquarters in the Edward Mallinckrodt Institute of Radiology, offers a basic course in X-ray technology and two one-year post-graduate courses. Each course leads to a certificate awarded by the Washington University School of Medicine, Department of Radiology.

X-ray Technology. This two-year, A.M.A. approved course covers by lectures and group discussion 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. Course work totals 400 hours.

During the first six months a student is on probation. Upon satisfactory completion of this work, he will be paid a monthly stipend of \$50 for the next six months. This stipend increases to \$75 for the third six months and \$100 for the last six months. During

the twenty-four months, the student is assigned tours of duty in various diagnostic and therapeutic areas for practical experience amounting to a total of 30 contact hours a week.

Candidates for admission must be graduates of an accredited secondary school and should rank in the upper third of their class. Special consideration is given to graduates of schools of nursing that are recognized by the State Board of Nurse Examiners and to students who have passed a college entrance examination. A one-year postgraduate course is offered in the fields of therapy, nuclear medicine, and special procedure radiology.

Nuclear Medicine Technology. This course covers twelve consecutive months divided between didactic course material (295 hours) and practical experience. The student receives a monthly stipend of \$300.

Candidates for admission must be registered technicians (ARRT) or registered nurses with two years of college or with a baccalaureate degree. Medical technologists or persons having a B.S. degree with a major in biology, chemistry, or physics may also be considered if they have completed basic courses in human anatomy and physiology of at least 60 class hours.

Radiation Therapy Technology. This course covers twelve consecutive months divided between didactic course material (264 hours) and practical experience. The student receives a monthly stipend of \$350. Candidates for admission must be registered X-ray technicians (ARRT) or registered nurses.

Officers and Committees of the Faculty of Medicine

Executive Faculty

William H. Danforth

Bridge Chancellor

Carl A. Dauten

Executive Vice Chancellor

M. Kenton King

Dean

Walter F. Ballinger

Bernard Becker

W. Maxwell Cowan

Philip R. Dodge

Herman N. Eisen

Samuel B. Guze

Carl G. Harford¹

John C. Herweg

Richard W. Hudgens

Carlton C. Hunt

Paul E. Lacy

William M. Landau

Oliver H. Lowry

James S. McDonnell²

Carl V. Moore

Joseph H. Ogura

Eli Robins

Robert E. Shank

David Schlessinger¹

C. Ronald Stephen

Juan Taveras

P. Roy Vagelos

James C. Warren

John L. Schultz

Recording Secretary

Faculty Council

The Faculty Council consists of all full-time members of the faculty with the rank of professor, associate professor, assistant professor, and those instructors who have been on the faculty for at least three years. The officers and executive committee are:

Mark A. Stewart, *Chairman*

Stanford Wessler, *Vice Chairman*

David E. Kennell, *Secretary*

David Schlessinger, *Preclinical Representative to the Executive Faculty*

Carl G. Harford, *Clinical Representative to the Executive Faculty*

Sondra Schlesinger, *Representative to the Senate Council of Washington University*

Luis Glaser

J. Russell Little, Jr.

Herbert Lubowitz

Philip W. Majerus

Morton Smith

Faculty of Medicine

The Faculty is composed of all members of the staff holding University appointments.

Standing Committees³

Committee on Admissions and Financial Aid

John C. Herweg, *Chairman*

John M. Anderson

Mordecai Blaustein

Luis Glaser

¹Representing the Faculty Council during 1970-71.

²Honorary member.

³The Dean is ex officio a member of all standing committees.

Duane C. Hellam
Rex L. Jamison
George H. Klinkerfuss
Philip W. Majerus
George E. Murphy
John L. Schultz
Jessie L. Ternberg
H. Phillip Venable
Robert A. Woodruff, Jr.

**Committee for the Beaumont-May
Institute of Neurology**

James L. O'Leary, *Chairman*
William M. Landau
Irwin Levy
Oliver H. Lowry
Henry G. Schwartz

Committee on Fellowship and Awards

George R. Drysdale, *Chairman*
David Apirion
Harvey R. Butcher
William H. Daughaday
Alan L. Pearlman

Committee for Laboratory Animal Care

M. Kenton King, *Chairman*
David H. Brown
Marguerite A. Constant
Arpad I. Csapo
William B. Hardin, Jr.
Phyllis M. Hartroft
Joseph E. Harvey
Franz M. Matschinsky
J. Neal Middelkamp
Alan L. Pearlman
Vernon J. Perez
Roy R. Peterson

Mabel Purkerson
S. David Rockoff
Robert E. Shank
Ernest S. Simms

Committee on Medical Education

Samuel B. Guze, *Chairman*
Walter F. Ballinger
Elmer B. Brown, Jr.
W. Maxwell Cowan
Carl Frieden
David Goldring
Joe W. Grisham
John C. Herweg, *ex officio*
Richard W. Hudgens, *ex officio*
Carlton C. Hunt
John L. Schultz, *ex officio*
Robert E. Shank
Four student representatives

**Committee for the Review of
Research on Human Beings**

Fred C. Reynolds, *Chairman*
Harvey Butcher
David Goldring
Carl G. Harford
Eugene N. Mitchell
Joseph H. Ogura
Juan Taveras
John D. Vavra
Stanford Wessler
George Winokur

Register of Students

FOURTH-YEAR CLASS 1970-71 INTERNSHIP 1971-72

Aronberg, Dixie Anderson, B.A., University of Arkansas, '67-University of Iowa Hospitals, Iowa City, Iowa

Aronberg, Jerome Milton, A.B., Washington University, '67-University of Iowa Hospitals, Iowa City, Iowa

Beasley, Clifton Harold, A.B., Stanford University, '67-Parkland Memorial Hospital, Dallas, Texas

Berger, Jack Edwin, A.B., University of Indiana, '66-Los Angeles County-U.S.A. Medical Center, Los Angeles, California

Berquist, Thomas Henry, B.A., Concordia College, '67; B.S. Med., University of North Dakota, '69-Mayo Graduate School of Medicine, Rochester, Minnesota

Blake, Robert Lincoln, Jr., A.B., Duke University, '67-North Carolina Memorial Hospital, Chapel Hill, North Carolina

Blanke, Thomas Joseph, A.B., Rockhurst College, '67-Barnes Hospital, St. Louis, Missouri

Blath, Richard Alan, B.A., Miami University, '68-Vanderbilt University Affiliated Hospitals, Nashville, Tennessee

Blevins, William Leonard, B.S., University of Idaho, '67-University of New Mexico Affiliated Hospitals, Albuquerque, New Mexico

Bloom, Marshall Elliott, A.B., Washington University, '67-St. Louis Children's Hospital, St. Louis, Missouri

Brewer, Lucy Eileen Doyle, B.A., Rice University, '67-St. Louis Children's Hospital, St. Louis, Missouri

Brown, Richard Arthur, A.B., Stanford University, '67-Presbyterian-St. Luke's Hospital, Chicago, Illinois

Bushyhead, James Butler III, B.A., Wesleyan University, '67-University of Kentucky Medical Center, Lexington, Kentucky

Carnesale, Sandra Mae, A.B., University of Michigan, '62-Mount Sinai Hospital, New York, New York

Cassell, Sidney Lee Isaacson, B.S., University of Michigan, '67-University of California Hospital, Los Angeles, California

Clamon, Gerald Henry, Dartmouth College-Barnes Hospital, St. Louis, Missouri

Clark, Edward Coe, B.S., Purdue University, '67-University of Miami Affiliated Hospitals, Miami, Florida

Cleary, Thomas George, B.S., St. Louis University, '67-St. Louis Children's Hospital, St. Louis, Missouri

Cohen, Alan Robert, B.A., M.A., Vanderbilt University, '61; B.D., Harvard University, '67-McLean Hospital, Belmont, Massachusetts

Cohen, Carla Beechie, B.A., University of Texas, '67-Boston City Hospital, Boston University, Boston, Massachusetts

Conway, Oren Michael, A.B., University of Michigan, '67-University of Chicago Hospitals and Clinics, Chicago, Illinois

Cooper, Dennis Charles, Tulane University-Mt. Sinai Hospital, Cleveland, Ohio

Corder, Clinton Nicholas, B.S., University of Kansas, '64; Ph.D., Marquette University Graduate School, '68-Barnes Hospital, St. Louis, Missouri

Corrigan, Joseph Louis, A.B., St. Louis University, '67-Children's Medicine Center, Dallas, Texas

Crespo, Jose Batacan, A.B., '66; B.S. Med., '68; University of South Dakota-Sioux Valley Hospital (University of South Dakota Affiliated Hospital), Sioux Falls, South Dakota

Crissey, Michael Merrill, A.B., Colorado State University, '67-University Hospital of San Diego County, San Diego, California

Daughaday, Carlos Colton III, A.B., Harvard College, '67-University of Minnesota Hospitals, Minneapolis, Minnesota

DeJohn, James Paul, B.S., Loyola University, '67-University Hospitals of Cleveland, Cleveland, Ohio

Diedrichsen, David Lloyd, University of Nevada-Michael Reese Hospital and Medical Center, Chicago, Illinois

- Diedrichsen, Jane Berrier, B.S., Arizona State University, '67-Children's Memorial Hospital (Northwestern University), Chicago, Illinois
- Eggebrecht, Russell Ernest, B.S., University of Illinois, '67-Jewish Hospital, St. Louis, Missouri
- Eiser, Thomas John, University of California (Riverside)-University of New Mexico Affiliated Hospitals, Albuquerque, New Mexico
- Ferguson, Ronald Morris, B.A., Augsburg College, '67-University of Minnesota Hospitals, Minneapolis, Minnesota
- Freidin, Miriam Ross, Long Island University-George Washington University Hospital, Washington, D.C.
- Friesen, Arthur David, A.B., Tabor College, '65; M.A., University of Kansas, '67-Toronto General Hospital, Toronto, Canada
- Gephardt, Gordon Neal, B.A., University of Kansas, '67
- Goldstein, Paul David, B.A., Massachusetts Institute of Technology, '67-St. Louis Children's Hospital, St. Louis, Missouri
- Harris, John Thomas, B.A., Johns Hopkins University, '67-Barnes Hospital, St. Louis, Missouri
- Hertzman, Phillip Alan, B.A., Washington University, '67-George Washington University Hospital, Washington, D.C.
- Hill, Thomas Charles, B.A., Purdue University, '67-New England Deaconess Hospital Boston, Massachusetts
- Johnson, Gregory Lawrence, B.A., Northwestern University, '67-Cincinnati General Hospital, Cincinnati, Ohio
- Johnson, James Howard, B.A., Southern Methodist University, '67-Passavant Memorial Hospital, Chicago, Illinois
- Keller, Harrison Bradley, Johns Hopkins University-U.S.A.F., Lackland Air Force Base, San Antonio, Texas
- Kilpatrick, William Robert, B.S. Med., University of South Dakota School of Medicine, '69-Los Angeles County Harbor General Hospital (Torrance), Los Angeles, California
- Kowaloff, Edward Mark, B.A., University of Rochester, '67-Boston City Hospital, II and IV Medical Service (Harvard), Boston, Massachusetts
- Kralovic, Mary Holland, University of West Virginia, '65-St. Luke's Hospital, St. Louis, Missouri
- Laibovita, Robert Alan, B.A., Washington University, '67-St. Luke's Hospital, San Francisco, California
- Lembeck, Lance James, A.B., San Diego State College, '67-University Hospital of San Diego County, San Diego, California
- Levy, Robert Milton, B.A., '65; M.S., '66; New York University-University of Chicago Hospitals and Clinics, Chicago, Illinois
- Ludwig, Barry Irwin, A.B., Washington University, '67-University of Colorado Affiliated Hospitals, Denver, Colorado
- Mayfield, Douglas Eugene, B.A., Harvard College, '67-Chicago Wesley Memorial Hospital, Northwestern University Medical Center, Chicago, Illinois
- Merrell, David Marx, A.B., Wabash College, '67-Vanderbilt University Affiliated Hospitals, Nashville, Tennessee
- Merritt, Joe Paul, B.S., Oklahoma State University, '69-Barnes Hospital, St. Louis, Missouri
- Noller, David William, University of Notre Dame-Barnes Hospital, St. Louis, Missouri
- Nugent, Kenneth Michael, B.A., University of Texas, '67-University of Iowa Hospitals, Iowa City, Iowa
- Oda, James Edward, A.B., Georgetown University, '67-San Francisco General Hospital, San Francisco, California
- Okamoto, Gary Akio, B.A., University of Hawaii, '66-St. Christopher's Hospital for Children, Philadelphia, Pennsylvania
- Patton, Allen James, A.B., Washington University, '67-University of Miami Family Health Center, Miami, Florida
- Peden, Joseph Carroll III, A.B., Colgate University, '67-Harkness Community Hospital and Medical Center, San Francisco, California
- Phelan, Elna Therene, B.A., Pomona College, '67-Boston City Hospital (Boston University), Boston, Massachusetts
- Potkin, Steven Garth, University of Illinois-Duke University Medical Center, Durham, North Carolina
- Quillin, William Henry, A.B., Washington University, '67-Los Angeles County-U.S.C. Medical Center, Los Angeles, California
- Richman, Edward Merle, B.S., Massachusetts Institute of Technology, '67-Cincinnati General Hospital, Cincinnati, Ohio
- Rigg, Lee Allen, B.A., Arizona State University, '61; Ph.D., University of Colorado, '65-University Hospital of San Diego County, San Diego, California
- Rose, Edward Philip, B.S., University of Notre Dame, '67-Jewish Hospital, St. Louis, Missouri

Rouse, Ernest Tuttle III, A.B., Princeton University, '67-Barnes Hospital, St. Louis, Missouri

Rubenstein, Morton Jerome, B.A., Johns Hopkins University, '67-Temple University Hospitals, Philadelphia, Pennsylvania

Ryan, Thomas Edwards, B.S., Southern Methodist University, '67-Cincinnati General Hospital, Cincinnati, Ohio

Saltzman, Stephen James, B.S., Tulane University, '67-Boston City Hospital, V and VI Medical Service (Boston University), Boston, Massachusetts

Schreiner, Richard Lawrence, B.S., St. Louis University, '67-St. Louis Children's Hospital, St. Louis, Missouri

Shapiro, Larry Jay, Washington University-St. Louis Children's Hospital, St. Louis, Missouri

Shaw, James Thomas, B.A., Westminster College, '67-University of Oklahoma Hospitals, Oklahoma City, Oklahoma

Simpson, Robert Marshall, B.S., University of Wisconsin, '67-University of New Mexico Affiliated Hospitals, Albuquerque, New Mexico

Sneid, David Sabara, A.B., Stanford University, '67-University of California Hospital, Los Angeles, California

Sonneborn, Robert Edgar, A.B., Washington University, '67-University of Miami Affiliated Hospitals, Miami, Florida

Spencer, Dennis Dee, A.B., Grinnell College, '67; B.S. Med., University of South Dakota School of Medicine, '69-Barnes Hospital, St. Louis, Missouri

Stenson, William Frederick, B.S., Providence College, '67-Barnes Hospital, St. Louis, Missouri

Stephens, Robert Frederic, B.S., University of Oklahoma, '67-Parkland Memorial Hospital, Dallas, Texas

Stephenson, Gary Sherman, B.A., University of Oklahoma, '67-Washington University Medical Center, Department of Ophthalmology, St. Louis, Missouri

Summers, William Koopmans, A.B., University of Missouri, '66-Barnes Hospital, St. Louis, Missouri

Swartout, Michael, A.B., Stanford University, '67-H. C. Morfitt-University of California Hospitals, San Francisco, California

Taylor, Stever John, A.B., Stanford University, '67-District of Columbia General Hospital (Georgetown University), Washington, D.C.

Telfer, James Gavin, Jr., Washington University-Montreal Children's Hospital, Montreal, Canada

Thorne, David Lee, A.B., University of Indiana, '67-Parkland Memorial Hospital, Dallas, Texas

Uhlemann, John Hosley, A.B., Grinnell College, '67-Cleveland Clinic Hospital, Cleveland, Ohio

Warnke, Roger Allen, B.S., University of Illinois, '67-Stanford University, Stanford, California

Weiner, Allen Benjamin, Pharm.D., University of California at Los Angeles, '65-Cedars Sinai Medical Center, Los Angeles, California

Weisenberger, Anthony Joseph, B.S., St. Louis University, '67-Mercy Hospital and Medical Center, San Diego, California

Wellauer, Robert Edward, B.S., University of Wisconsin, '67-Cedars Sinai Medical Center, Los Angeles, California

Wexler, Laura Fooner, A.B., Barnard College, '67-Boston City Hospital, II and IV Medical Service (Harvard), Boston, Massachusetts

Wharton, Thomas Parker, Jr., B.S., Yale University, '67-Peter Bent Brigham Hospital, Boston, Massachusetts

Zimmermann, George Jay, B.S., Texas Wesleyan University, '67-University Hospital, Little Rock, Arkansas

THIRD-YEAR CLASS 1970-71

Achterman, Christopher Alan, B.S., Oregon State University, '70-Salem, Oregon

Avery, David Hartford, B.A., Wabash College, '68-Portage, Indiana

Baron, Roy Clifford, B.S., University of Wisconsin, Madison, '68-Staten Island, New York

Basolo, Mary Susan, B.S., University of Oklahoma, '68-Muskogee, Oklahoma

Benoist, Walter Fischel, A.B., University of Pennsylvania, '68-St. Louis, Missouri

Bialecki, Leon, B.S., Long Island University, '68-Antwerp, Belgium

Bieri, Michael David, B.A., Kansas University, '68-California, Missouri

Biggs, Fred Douglas, A.B., Vanderbilt University, '68-Poplar Bluff, Missouri

Blank, William Frederick, Jr., A.B., Washington University, '67-Decatur, Illinois

Flinn, John Ferguson III, B.A., University of Colorado, '68-Stockton, California

- Blohm, Janet Christina, A.B., University of California (Berkeley), '65-San Francisco, California
- Brahos, George James, B.S., Loyola University (Chicago), '68-Hammond, Indiana
- Brazy, Jane Elmlade, B.S., University of Colorado, '67-Greeley, Colorado
- Brazy, Peter Coffin, B.S., University of Wisconsin, '68-Menomonee Falls, Wisconsin
- Brodsky, Richard Dean, B.A., Johns Hopkins University, '68-West Haven, Connecticut
- Burke, Larry Dale, B.A., University of Iowa, '68-Clarinda, Iowa
- Campbell, Edward Joseph, B.S., Purdue University, '69-Hoopeston, Illinois
- Coble, Robert Vaughn, B.A., Emory University, '68-Frankewing, Tennessee
- Cohen, David John, B.A., Rice University, '68-San Antonio, Texas
- Collins, Eugene, B.A., Hobart College, '68-Brooklyn, New York
- Collins, Myra Lou, B.S., Duke University, '68-Marshville, North Carolina
- Crown, Loren Arthur, University of Kansas-Kansas City, Kansas
- Doisy, Edward Adelbert III, B.A., Central Methodist College, '68-Webster Groves, Missouri
- Don, Irl Joseph, Washington University-University City, Missouri
- Eisenberg, John Meyer, A.B., Princeton University, '68-Memphis, Tennessee
- Faul, Robert Louis, B.A., Wabash College, '68-Evansville, Indiana
- Feldman, Charles Alan, B.S., Bradley University, '69-Sheboygan, Wisconsin
- Fleckman, Philip Howard, B.A., University of Texas, '68-Port Arthur, Texas
- Freed, Avery Morton, B.A., University of California (Santa Barbara), '69-Mill Valley, California
- Fry, Robert Dean, B.A., Oklahoma City University, '68-Beaver, Oklahoma
- Fuller, David Lee, B.S., University of Notre Dame, '68-Mt. Carmel, Illinois
- Fulmer, Adrian Arthur, B.S., University of Illinois, '68-Rantoul, Illinois
- Gaunt, Frank Peyton III, A.B., Oberlin College, '68-Webster Groves, Missouri
- Glode, Leonard Michael, Jr., University of Nebraska-Chadron, Nebraska
- Glode, Mary Rose, University of Nebraska-Rolling Meadows, Illinois
- Golden, Jeffrey Austin, B.A., Yale University, '68-New York, New York
- Gollhofer, John Gordon, B.S., Yale University, '68-Rochelle, Illinois
- Gottlieb, Charlene Chang, A.B., Radcliffe College, '66-Morton Grove, Illinois
- Gradman, Alan Howard, A.B., Duke University, '68-Jacksonville, Florida
- Hafken, Louis, A.B., Washington University, '68-San Antonio, Texas
- Hammerman, Marc Randall, A.B., Washington University, '69-Olivette, Missouri
- Harder, Eric Michael, B.A., University of Illinois, '69-Glen Ellyn, Illinois
- Hawkins, Calvin Dale, Jr., B.A., Westminster College, '68-Norman, Oklahoma
- Herbold, David Robert, A.B., Washington University, '68-Shaker Heights, Ohio
- Hertel, Bruce Frederick, University of Wisconsin (Madison)-Scottsdale, Arizona
- Hill, Geoffrey William, B.A., Tufts University, '68-Zanesville, Ohio
- Hill, Thomas Clark, B.A., Southern Illinois University, '68-Edwardsville, Illinois
- Holekamp, Timothy Louis Robert, B.A., Amherst College, '68-Kirkwood, Missouri
- Jacobs, Charlotte DeCroes, A.B., University of Rochester, '68-Kingsport, Tennessee
- Jacobs, Richard Alan, A.B., Oberlin College, '68-St. Louis, Missouri
- Jedlickova, Eva, University J. E. Purkyne-St. Louis, Missouri
- Kaiser, Jay Albert, A.B., University of Illinois, '68-West Frankfort, Illinois
- Kapusta, George Rudolph, B.S., Loyola University, '68-Chicago, Illinois
- Kauffman, Edward Charles, B.A., University of Arizona, '68-Tucson, Arizona
- Lisberg, Kenneth Jay, University of Wisconsin, '68-Milwaukee, Wisconsin
- Long, Dallas Crutcher II, D.D.S., University of Southern California, '66-Phoenix, Arizona
- Maher, Chauncey Carter III, B.A., Wabash College, '67-Springfield, Illinois
- Mannino, Frank Louis, A.B., Knox College, '68-Chicago, Illinois
- Maurer, Marvin M., Jr., Washington University-Bloomington, Illinois

McWilliams, Jane Ogden, B.S., Rensselaer Polytechnic Institute, '68-Paducah, Kentucky

Meyers, James Howard, B.S., Trinity College, '68-Los Alamos, New Mexico

Miller, Charles William III, B.S., Trinity College, '68-Western Springs, Illinois

Miller, Douglas Kent, A.B., Stanford University, '68-Wichita, Kansas

Mollman, Joan Elizabeth, B.A., Northwestern University, '68-St. Louis, Missouri

Moscoe, Newton Dee, B.A., University of Oklahoma, '67-Norman, Oklahoma

Mosley, Julian Cedell, Jr., B.S., St. Louis University, '66-St. Louis, Missouri

Murfin, Wesley Warren, B.A., Washington and Lee University, '68-Decatur, Illinois

Musser, Wayne Eugene, Jr., A.B., University of California (Berkeley), '68-Petaluma, California

Nathan, Toby Janet, A.B., Barnard College, '66-New York, New York

Nelson, Robert J., A.B., Grinnell College, '68-Chicago, Illinois

Nikaitani, Peter Kenjiro, B.A., Whitman College, '68-Seattle, Washington

Osborn, Thomas Grant, B.S., Purdue University, '68-Elkhart, Indiana

Parker, John Anthony, B.A., Yale University, '68-Wilmette, Illinois

Pita, Julio Cesar, Jr., B.S., Georgia Institute of Technology, '67-Miami, Florida

Porchey, Carl Joseph, Jr., B.A., Westminster College, '68-Festus, Missouri

Potts, Daniel Eldon, B.S., Baylor University, '68-Waco, Texas

Rappaport, Allan Harvey, A.B., Oberlin College, '68-Toledo, Ohio

Roberts, William Virgil, Jr., Ohio State University-Columbus, Ohio

Robinson, Lary Allen, B.A., University of Kansas, '68-Iola, Kansas

Rosenbaum, Robert Allen, A.B., Washington University, '68-Anderson, Indiana

Rosenthal, Stuart Louis, B.S., Michigan State University, '68-Tulsa, Oklahoma

Ross, William Joseph, B.A., Miami University, '68-Antwerp, Ohio

Sainz, Claudia Lizbeth, A.B., Washington University, '68-Florissant, Missouri

Santa Maria, Maria Dolores, B.S., College of Idaho, '68-Logrono, Spain

Scheible, Robert Frank, B.A., Johns Hopkins University, '68-Racine, Wisconsin

Schwarz, Kathleen Brogan, B.A., Scripps College, '64; M.A., Northwestern University, '65-St. Louis, Missouri

Seale, Robert Holt, B.S., University of Idaho, '67-Moscow, Idaho

Shaw, Ronald Ahrend, B.S., University of Toledo, '68-Toledo, Ohio

Sheehan, Michael Bernard, B.S., Rockhurst College, '68-Kansas City, Missouri

Shield, Charles Franklin III, B.S., University of Oklahoma, '66; M.S., '68-Huntsville, Alabama

Solis, George Patrick, B.S., Centenary College, '65-Port Arthur, Texas

Tepper, Joel Elliott, B.S.E.E., Massachusetts Institute of Technology, '68-Fall River, Massachusetts

Van Amburg, Albert Lee III, A.B., Washington University, '68-St. Louis, Missouri

Wachsman, Richard Murray, A.B., University of California at Los Angeles, '68-North Hollywood, California

Wallace, Bruce James, B.S., University of Nevada, '68-Minden, Nevada

Warfel, Kathleen, B.S., Butler University, '67-Indianapolis, Indiana

White, Richard Harvey, B.A., University of California at Santa Barbara, '68-Portland, Oregon

Wicks, Rita Addison, B.S., Purdue University, '67-Carthage, Indiana

Wiesmann, William Paul, A.B., University of Cincinnati, '68-Kettering, Ohio

Wright, Sydney Thurman, Jr., B.A., Raymond College, '67-Selma, California

Zaleman, Steven Jay, A.B., Washington University, '68-Kansas City, Missouri

SECOND-YEAR CLASS 1970-71

Anderson, Lynn Ellen, B.S., Muhlenberg College, '70-Staten Island, New York

Anhalt, John Paul, B.A., Johns Hopkins University, '65; Ph.D., '70-Monterey Park, California

Ayer, Patrick Craig, B.A., University of Notre Dame, '69-St. Louis, Missouri

Baenziger, Jacques Ulrich, B.A., New College, '69-Knoxville, Tennessee

- Barnes, William Whitley III, A.B., Washington University, '69-St. Louis, Missouri
- Beall, Gregory Duncan, B.A., Johns Hopkins University, '69-Richfield, Minnesota
- Birkenmeier, Edward Henry, A.B., Washington University, '69-St. Louis, Missouri
- Black, John Scott, B.A., University of California (San Diego), '69-San Diego, California
- Blumberg, Lesley Zlotta, B.A., University of California (Riverside), '69-Los Angeles, California
- Blumhagen, Joel Dean, A.B., Stanford University, '69-Puyallup, Washington
- Boyd, James Clark, B.S., University of Colorado, '69-Mandan, North Dakota
- Bussmann, Donald William, Jr., B.A., College of the Holy Cross, '67-St. Louis, Missouri
- Caplan, William Mark, B.S., University of Wisconsin, '69-Columbus, Ohio
- Carlson, David John, B.A., Wabash College, '69-Evansville, Indiana
- Classen, Yvonne Lois, B.A., Tabor College, '69-Wichita, Kansas
- Cohen, Milton Tepper, B.A., University of California (Berkeley), '69-Madison, Wisconsin
- Collins, Robert Leo, B.A., College of the Holy Cross, '69-Albany, New York
- Condit, John Michael, B.A., University of Arkansas, '69-DeRidder, Louisiana
- Cooper, Barbara Joan, A.B., Washington University, '69-South Orange, New Jersey
- Cooper, Byron Stanley, B.A., Johns Hopkins University, '69-Chevy Chase, Maryland
- Cramer, Stewart Frederick, A.B., Cornell University, '69-Utica, New York
- DeLozier, Howard Luther, B.S., Juniata College, '69-Duncansville, Pennsylvania
- Duff, William Michael, B.A., Westminster College, '67; B.A., Oxford University, '70-Houston, Missouri
- Earl, Arthur David, B.S., University of Idaho, '69-Burley, Idaho
- Farber, Barry Scott, Texas A & M University-Overland Park, Kansas
- Fazzio, Frank James, Jr., Marquette University-Rockford, Illinois
- Finkel, Michael Francis, A.B., Washington University, '69-St. Louis, Missouri
- Glogovac, S. Vic, A.B., Washington University, '69-St. Louis, Missouri
- Guletz, John Dennis, B.A., University of Notre Dame, '69-St. Louis, Missouri
- Hill, Edward Feldin, B.S., U.S. Military Academy, '63-Olympia, Washington
- Hirsch, John David, Case Western Reserve University-St. Louis, Missouri
- Holland, Edward Irving, B.S., University of Chicago, '69-New York, New York
- Hooper, David Crittenden, B.A., University of Texas (Austin), '69-Lubbock, Texas
- Hosler, Mark Wayne, A.B., University of Missouri (Columbia), '69-Higginsville, Missouri
- Huddleston, Howard Lee, B.S., Texas A and M University, '69-Houston Texas
- Jacobi, Mark David, B.S., University of Michigan, '69-LaPorte, Indiana
- Jacobs, Arthur Elliott, B.A., University of Kentucky, '69-Lexington, Kentucky
- Jenkins, Mark Schering, B.A., University of Texas (Austin), '69-Houston, Texas
- Kaplan, David, A.B., Case-Western Reserve University, '69-South Euclid, Ohio
- Karin, Daniel A., B.S., Tulane University, '69-San Antonio, Texas
- Karl, Robert Harry, B.A., Northwestern University, '69-Milwaukee, Wisconsin
- Kerns, Gale Gordon, University of Montana-Chinook, Montana
- Knowlton, Edward Wells, Michigan State University-Dayton, Ohio
- Knudson, Donald Henry, B.A., Iowa State University, '69-Yankton, South Dakota
- Koskella, Kenneth Ray, B.S., University of Idaho, '69-McCall, Idaho
- Krusack, Louisa May, University of Illinois-LaGrange Park, Illinois
- Lee, King Tak, B.S., University of Hong Kong (Chung Chi College), '68-Kowloon, Hong Kong
- Lehman, Judith Anne, Marquette University-Loves Park, Illinois
- Levine, Marc Albert, B.A., Rice University, '69-Houston, Texas
- Lipson, Ace, B.A., New York University, '69-Fall River, Massachusetts
- Martin, Samuel Kofele, Reed College-Buea, West Cameroon
- McCarty, Michael Allan, A.B., Washington University, '69-St. Louis, Missouri
- Michael, John Mark, B.A., University of Kansas, '69-Wichita, Kansas
- Milder, Barry David, B.S., Massachusetts Institute of Technology, '69-St. Louis, Missouri

Miller, Douglas Parker, B.A., University of California (San Diego), '69-San Diego, California

Miller, Jeffrie Davis III, University of Missouri (St. Louis)-St. Louis, Missouri

Minkes, Mark Stanley, Washington University-St. Louis, Missouri

Moran, Jon Frederick, B.A., Yale University, '68-South Bend, Indiana

Moses, Alan Charles, B.S., Duke University, '69-Gardner, Massachusetts

Namey, Thomas Curtis, B.A., Thiel College, '69-Farrell, Pennsylvania

Nichols, Steven Henry, B.A., Vanderbilt University, '69-Largo, Florida

Novack, Mark Alan, Massachusetts Institute of Technology-St. Louis, Missouri

Nuelle, Douglas Gregory, B.S., University of Missouri (St. Louis), '69-St. Louis, Missouri

Nunnelee, Keith Hunter, B.S., University of Wisconsin, '69-New Berlin, Wisconsin

Paulin, Julius Fredrick, B.A., University of Colorado, '69-Buena Vista, Colorado

Peterson, Alan Carl, B.S., University of Michigan, '69-Ludington, Michigan

Plasse, Terry Freeman, A.B., Brandeis University, '69-Great Neck, New York

Rassen, Joshua Herbert, A.B., Harvard College, '68-Brookline, Massachusetts

Reinhard, John D'Arcy, B.A., Cornell College, '69-St. Louis, Missouri

Richmond, Dennis, B.S., Purdue University, '69-Wakarusa, Indiana

Root, Paul Everett, B.A., University of California (San Diego), '69-San Diego, California

Rubenstein, William Allan, A.B., Washington University, '69-Forest Hills, New York

Schmidt, Robert Edward, A.B., Washington University, '69-St. Louis, Missouri

Schroer, Kenneth Ray, Kearney State College-Kearney, Nebraska

Scruggs, Karen LaFrance, B.A., Macalester College, '68-Selma, North Carolina

Seegers, James Victor, B.A., Concordia Senior College, '67-Hoyleton, Illinois

Shapiro, Allan James, A.B., Stanford University, '69-Los Angeles, California

Shepherd, Eugene Meredith III, B.A., David Lipscomb College, '69-Nashville, Tennessee

Shuck, Edwin Haywood III, B.A., New College, '69-Lookout Mountain, Tennessee

Simpson, Lucien Caldwell, B.A., David Lipscomb College, '69-Nashville, Tennessee

Stempel, Jerrold Martin, B.S., University of Illinois, '69-Northbrook, Illinois

Turi, George Kenneth, A.B., Columbia University, '69-Woodmere, New York

Twitchell, Annette, B.S., Washington State University, '69-Waimanalo, Hawaii

Vine, William H., Washington University-Dallas, Texas

Waldbaum, Lawrence Sidney, A.B., Cornell University, '69-Cedarhurst, New York

Walters, Richard Coburn, B.S., University of Illinois, '69-Monticello, Illinois

Weaver, Nancy E., B.S., Montana State University, '69-Billings, Montana

Weintraub, Jonathan, B.A., Reed College, '69-Flushing, New York

Weisman, Robert Alan, A.B., Washington University, '69-Tulsa, Oklahoma

Weiss, Jay Harlan, A.B., Washington University, '69-St. Louis, Missouri

White, William Gregory, B.A., College of the Holy Cross, '69-River Forest, Illinois

Wilhelm, James Paul, B.S., University of Idaho, '69-Post Falls, Idaho

Wittenborn, John Richard, Jr., A.B., Rutgers University, '69-Highland Park, New Jersey

Yanover, Robert Alan, University of Rochester-Roslyn Heights, New York

Zerdecki, John Wells, B.A., Rice University, '69-Fort Worth, Texas

Ziman, Ronald Bert, University of California (Santa Barbara)-Los Angeles, California

FIRST-YEAR CLASS 1970-71

Anderson, Wilfred Louis, B.A., Fisk University, '69-Montgomery, Alabama

Baker, James Peter, B.S., Syracuse University, '70-Batavia, New York

Berg, Alfred Oren, B.A., Tabor College, '70-Wichita, Kansas

Berger, Mark Leslie, B.A., University of Rochester, '70-St. Louis, Missouri

Bertram, Dennis Anna, A.B., Indiana University, '70-Evansville, Indiana

Bixby, Linda Gay, Brown University-Windham, Connecticut

Blackman, Jon Arthur, B.S., Oregon State University, '70-North Bend, Oregon

- Boyers, Jerold Edmund, B.A., Knox College, '69-Teaneck, New Jersey
- Bradof, James Edward, B.A., Northwestern University, '70-Franklin Park, Illinois
- Broudy, Bruce Charles, B.S., Michigan State University, '70-Olivette, Missouri
- Brouillette, Robert Tate, Jr., A.B., Providence College, '69-Rockville, Maryland
- Burgdorf, Max Henry, Jr., A.B., Washington University, '70-Des Moines, Iowa
- Burrows, Stephen Dale, B.S., University of Illinois, '70-Urbana, Illinois
- Clark, Howard Brent, B.A., Macalester College, '70-Truman, Minnesota
- Clark, Joan Cathje, B.A., University of Minnesota, '70-Stewartville, Minnesota
- Coleman, William Sanford, B.A., Central Methodist College, '70-DeSoto, Missouri
- Corry, James Marshall, A.B., Grinnell College, '70-St. Louis, Missouri
- Crandell, Sharon Sue, B.S., Rice University, '70-Terre Haute, Indiana
- Crumbley, Arthur Jackson III, B.S., Davidson College, '70-Atlanta, Georgia
- DeGuerre, Ronald Keith, Washington University-North Canton, Ohio
- Depper, Joel Michael, A.B., Stanford University, '70-Woodland Hills, California
- Donohoe, Louise Anne, A.B., Trinity College, '70-New York, New York
- Douglas, James Reyburn, Jr., A.B., Dartmouth College, '70-Memphis, Tennessee
- Edelstein, Mark Binder, University of Wisconsin, St. Louis, Missouri
- Entis, Gregory Neil, B.S., Williams College, '69-Sands Point, New York
- Fischbein, Lewis Conrad, B.S., University of Rochester, '70-Short Hills, New Jersey
- Fleischman, Scott Clonick, B.S., University of Illinois, '70-Chicago, Illinois
- Frantz, Kurt Smith, B.A., University of Oklahoma, '70-Enid, Oklahoma
- Fuller, Terry Allen, B.S., University of Notre Dame, '70-Mt. Carmel, Illinois
- Gangnes, Richard Alan, B.A., University of California (Santa Barbara), '70-Santa Ana, California
- Glickman, Peter, A.B., University of California (Berkeley), '70-New York, New York
- Golden, Paul, B.S., Yale University, '70-New York, New York
- Graham, Donald Richardson, B.S., University of Notre Dame, '70-Springfield, Illinois
- Graul, Richard Steven, A.B., Washington University, '70-St. Louis, Missouri
- Greenfield, Andrew Kent, B.A., Northwestern University, '70-Old Westbury, L.I., New York
- Grimes, Pearl Evelyn, Jackson State College-Woodville, Mississippi
- Gutwein, Michael B., A.B., Harvard College, '69-West Hempstead, New York
- Hattan, Richard Alan, B.S.M.E., University of Colorado, '70-Denver, Colorado
- Herold, Robert Earl, B.A., Wabash College, '70-Evansville, Indiana
- Hoff, Mark Lloyd, A.B., University of California (Berkeley), '70-Lodi, California
- Hu, Lucy Helen, B.S., University of Maryland, '70-College Park, Maryland
- Hudson, James Melvin, A.B., Harris Teachers College, '66-St. Louis, Missouri
- Hyk, Natalia Roksolana, Washington University-Griggsville, Illinois
- Jaffe, Mark Howard, B.A., Yale University, '70-Ardsley, New York
- Kahn, Ronald Frank, B.S., University of Texas (Austin), '70-El Paso, Texas
- Kaplan, Roslyn Ann, B.S., Western Reserve University, '70-Staten Island, New York
- Kaufman, Kenneth Roland, A.B., Columbia University, '68; A.M., Harvard College, '69-East Norwich, New York
- Keller, David Charles, B.A., Valparaiso University, '70-Union, Illinois
- Kirkpatrick, Robert Bruce, B.S., Wisconsin State University (Eau Claire), '70-Madison, Wisconsin
- Kitchell, Margaret Anne, B.A., Reed College, '70-Ames, Iowa
- Kozak, Stefan Paul, A.B., Washington University, '70-St. Louis, Missouri
- Krettek, John Edwin, Jr., B.S., Regis College, '70-Council Bluffs, Iowa
- Lange, David Richard, A.B., Dartmouth College, '70-New Carlisle, Ohio
- Larrey, Richard Morris, B.A., University of Texas, '70-Houston, Texas
- Lawrence, Charles Barnes, B.S., Massachusetts Institute of Technology, '70-Binghamton, New York
- Leiner, Matthew Saul, A.B., Rutgers University, '70-Highland Park, New Jersey

- Leshin, Mark, B.A., University of Texas, '70-Robstown, Texas
- Liang, Howard Grant, B.A., Yale College, '70-St. Louis, Missouri
- Lindstrom, Eric Richard, B.S., University of Washington, '70-Bremerton, Washington
- Lockett, John Stanford, B.S., U.S. Air Force Academy, '70-Lake City, Florida
- Mann, Jonathan Max, A.B., Harvard College, '69-Waban, Massachusetts
- Marsh, Kim Ernest, Indiana University-Indianapolis, Indiana
- Meredith, Stephen Charles, A.B., Brandeis University, '70-Kings Point, New York
- Minshew, Nancy Jean, Mills College-ElDorado Hills, California
- Moroni, Rosemary Iolanda, B.S., University of Missouri (Columbia), '70-St. Louis, Missouri
- Nachtwey, Frederick Joseph, B.A., University of Notre Dame, '70-Springfield, Illinois
- Nahm, Moon Hea, A.B., Washington University, '70-St. Louis, Missouri
- Newton, Patricia Ann, B.S., A.M. & N. College Arkansas; M.A., George Peabody College, '69-Little Rock, Arkansas
- Oleck, Adrian Martin, B.A., Northwestern University, '70-Park Ridge, Illinois
- Orkand, Steven Paul, B.A., Reed College, '70-Los Angeles, California
- Osteen, Thomas Lee, B.A., University of Kansas, '70-Kansas City, Kansas
- Paull, Barry Ross, A.B., University of California (Berkeley), '65-San Francisco, California
- Penkoske, Patricia Ann, A.B., Lindenwood College, '69-St. Charles, Missouri
- Peterson, McKim Culver, B.S., Yale University, '70-Fort Collins, Colorado
- Potter, Charles Roy, B.S., Michigan State University, '70-Royal Oak, Michigan
- Rice, Gregory Allen, B.S., University of Washington, '70-Seattle, Washington
- Rickles, David Jonathan, University of California (Los Angeles)-Beverly Hills, California
- Rollings, John William, Washington University-Springfield, Missouri
- Rosenblum, Jerry Lee, B.A., Emory University, '70-Nashville, Tennessee
- Rouse, Robert Vance, B.S., Northwestern University, '70-St. Louis, Missouri
- Samson, Barry Landau, B.A., University of Wisconsin, '70-Milwaukee, Wisconsin
- Scheff, Robert James, A.B., Dartmouth College, '70-St. Louis, Missouri
- Schreiber, Mark Traudt, B.S., University of Nebraska, '70-Alliance, Nebraska
- Schwartz, David Johann, B.A., University of Denver, '70-Essex Fells, New Jersey
- Schwartz, Fredrick Jack, University of Nebraska-Axtell, Nebraska
- Schwartz, Lawrence Barry, B.S., University of Illinois, '70-Glencoe, Illinois
- Shatz, Gerald Stephen, B.A., Northwestern University, '70-St. Louis, Missouri
- Sheffner, Paul Wayne, B.A., Wabash College, '70-Crawfordsville, Indiana
- Siegel, Richard Lawrence, A.B., Washington University, '70-Miami, Florida
- Silvoso, Gerald Robert, A.B., University of Missouri (Columbia), '70-Columbia, Missouri
- Sitz, William Norman, B.A., College of Idaho, '70-Ontario, Oregon
- Songer, William Lee, B.A., Wabash College, '70-Veedersburg, Indiana
- Southworth, William Frederick, A.B., Washington University, '69-St. Louis, Missouri
- Stratton, William Clayton, B.S., University of Illinois, '70-Wood River, Illinois
- Taustine, Lloyd Ross, B.A., Vanderbilt University, '70-Louisville, Kentucky
- Thomas, Leyland Arthur, Colorado State University-Georgetown, Guyana
- Thuline, Dale Nathan, B.A., Seattle Pacific College, '70-Seattle, Washington
- Tiefenbrunn, Alan James, A.B., Washington University, '70-St. Louis, Missouri
- Timen, Sanford Martin, B.S., University of Cincinnati, '70-Mayfield Heights, Ohio
- Turk, John Wayne, A.B., Washington University, '70-Crystal City, Missouri
- Weidner, Bruce Van Scoyoc II, B.S., Davidson College, '69-Middletown, Ohio
- Weil, David Samuel, B.S., Indiana University, '64-Bloomington, Indiana
- Weiss, Robert Alan, B.A., New York University, '70-Bronx, New York
- Weller, Ronald Alan, B.A., Wabash College, '70-Evansville, Indiana
- Wener, Mark Howard, B.A., University of Chicago, '70-Chicago, Illinois
- Wichterman, Keith Allen, University of Illinois-New Berlin, Illinois
- Willbrand, Jeffrey William, A.B., Harvard College, '70-St. Charles, Missouri

Williams, Michael Orval, B.A., University of Missouri (St. Louis), '70-St. Louis, Missouri
 Wolbarsht, Richard Lorin, A.B., Harvard College, '70-Waban, Massachusetts
 Woodrow, Thomas Wilson, Louisiana Polytechnic Institute-Alexandria, Louisiana
 Woolf, Margaret Nessa, B.A., Wellesley College, '70-St. Louis, Missouri
 Yarian, David Logan, A.B., Washington University, '69-Angola, Indiana
 Zeller, John Edward, B.S., Xavier University, '70-Springfield, Ohio

GRADUATE PROGRAM IN HEALTH CARE ADMINISTRATION

Second-Year Class 1970-71

Elliott, David Joe, B.S., Florida Southern College, '65-Lyndhurst, New Jersey
 Galeucia, Linwood Wilbert, B.S., Boston University, '66-Wayland, Massachusetts
 Gandy, Patrick Wiley, B.S., Northwestern State College, '61-Many, Louisiana
 Garrett, James Herchel, B.A., Texas Christian University, '66; M.A., '69-Hurst, Texas
 Goode, David Joseph, B.A., University of Vermont, '65-Ithaca, New York
 Hennelly, Virginia Drone, B.S., Maryville College, '66-Clayton, Missouri
 Hickok, Robert James, B.S., Washington University, '53-Florissant, Missouri
 Holland, Benjamin Franklin, B.S., Howard University, '53-Columbus, Ohio
 Holley, Robert Columbus, B.S., Troy State College, '53-Samson, Alabama
 Hurteau, William James, B.S., Indiana University, '65-Bloomington, Indiana
 Kaseff, Harold Howard, B.S., Indiana University, '61-Indianapolis, Indiana
 Kovack, Anton William, III, B.S., University of Illinois, '65-Westville, Illinois
 Lowmaster, Gary Kent, B.S., Southern Colorado State College, '69-Pueblo, Colorado
 Maguire, Edward Francis, B.A., University of Montana, '66-Huachuca, Arizona
 Manderfield, Nicholas Walter, B.S., University of Detroit, '63-Mesa, Arkansas
 Meives, Lawrence Thomas, B.S., St. Louis University, '65-St. Louis, Missouri
 Pede, James Edward, B.S., University of North Dakota, '59-Wessington Spring, South Dakota

Pfeiffer, Phillip Earnest, B.B.A., St. Norbert College, '69-Kansas City, Missouri
 Reiting, Thomas Anthony, B.B.A., Wisconsin State University, '67-Shorewood, Wisconsin
 Rick, Leo Michael, B.A., Lamar State College of Technology, '65-Beaumont, Texas
 Reuter, Steven Wayne, B.B.A., The University of Iowa, '69-Moline, Illinois
 Salter, Gilbert Everett, B.A., New Mexico Highlands University, '51; M.A., '53-Clarendon Hills, Illinois
 Soderholm, John Carl, A.B., Flint Community Junior College, '63; B.A., Michigan State University, '65-St. Louis, Missouri
 Thereau, Robert Stephen, A.A., Harris Teachers College, '59; B.S., Southwest Missouri State College, '61-St. Louis, Missouri
 Torrington, Patricia Rogers, B.S.N., Wayne State University, '61-St. Louis, Missouri
 Weatherford, Richard Paul, B.S., Southern Colorado State College, '67-Monroe, Georgia
 Wheeler, Robert Benjamin, A.A., Bismarck Junior College, '60; B.S., Jamestown College, '63-Lusk, Wyoming

First-Year Class 1970-71

Abell, Richard Michael, B.S., Western Kentucky University, '63; M.A., '65-Bowling Green, Kentucky
 Anderson, John Kendall, B.A., Willamette University, '65-Milwaukie, Oregon
 Andrews, Kevin Richard, B.B.A., Texas A & M University College, '66-El Paso, Texas
 Blan, Gary James, B.S., Bethany Nazarene College, '69-Bethany, Oklahoma
 Booker, George Wesley, B.S., Agricultural, Mechanical & Normal College, '67-Kansas City, Kansas
 Bradbury, Robert Carl, B.S., Holy Cross College, '67; M.S., George Washington University, '71-Sandord, Florida
 Buechner, David William Walter, A.A., East Los Angeles Junior College, '58; B.A., California State College, '62-Nashville, Tennessee
 Burger, Joseph Burtram, B.S., Boston University, '66-New Bedford, Massachusetts
 Burtram, Sarah Gahan, B.A., Dominican College, '70-Houston, Texas
 Corbin, Sandra May, A.B., Central Methodist College, '64-St. Louis, Missouri
 Covert, Michael Henri, B.S., Washington University, '70-Scarsdale, New York

DeGolier, Ronald Charles, B.S., Carroll College, '67-Madison, Wisconsin

Dowl, Barbara DeSha, A.A., Southeast Missouri State College, '63; B.S., Washington University, '66; M.S., '68-St. Louis, Missouri

Fahlberg, Willson Joel, Jr., B.B.A., University of Texas, '68-Houston, Texas

Frank, Doris Jean, B.A., Wartburg College, '65-St. Louis, Missouri

Frieser, Harold Oswald Karl, B.A., Dallas College of Southern Methodist University, '67-Dallas, Texas

Goldstein, Stephen Barry, B.S., State University of New York, '69-Long Island, New York

Hidde, Albert John, B.S., University of Wisconsin, '60-Neenah, Wisconsin

Holzhauser, George Gerald, B.A., Wheaton College, '70-Muscatine, Iowa

Johnson, Clayborne Blaine, B.S., Norfolk State College, '70-Jersey City, New Jersey

Kantanice, Stanley Joseph, B.S., University of Buffalo, '65-Springfield, Pennsylvania

Koppel, Robert Frederic, B.S., University of Oklahoma, '68-Benton, Arkansas

Lange, William Henry, B.A., St. Benedict's College, '70-St. Louis, Missouri

Maraz, Ronald Nicholas, B.S., University of Omaha-Cliffside Park, New Jersey

Mathis, Larry Lee, B.A., Kansas State College, '65-St. Louis, Missouri

Monical, Beverly Baptist, B.S., Washington University, '60-Kirkwood, Missouri

Nielson, Richard Daniel, B.S., Bethany Nazarene College, '70-Bethany, Oklahoma

Potter, Glenn Edward, B.A., Ottawa University, '65-Canton, Illinois

Rentfro, Larry Dean, B.S., Oklahoma State College, '64-Tulsa, Oklahoma

Reynolds, Stephen Curtis, B.S., Arkansas State University, '68-Little Rock, Arkansas

Rielly, Richard Albert, A.B., Colgate University, '62; M.S.W., Boston College, '64-Hingham, Massachusetts

Schraver, Walter Jerome, B.A., Elmhurst College, '62; M.Div., Eden Theological Seminary, '70-Webster Groves, Missouri

Stone, Carl Patrick, B.A., Drake University, '62-Des Moines, Iowa

West, Robert Christopher, B.A., Simpson College, '70-Des Moines, Iowa

Yorke, Harvey Mitchell, B.S., University of Missouri, '70-St. Louis, Missouri

PROGRAM IN OCCUPATIONAL THERAPY

Senior Class 1970-71

Duddy, Patricia Mary, Colorado State University-St. Louis, Missouri

Geier, Cynthia Ann, University of Missouri (Columbia)-St. Louis, Missouri

Kolker, Linda Rae, University of Missouri (St. Louis)-St. Louis, Missouri

Kopolow, Michele Susan, Washington University-St. Louis, Missouri

Mettler, Patricia Ann, Washington University-New Douglas, Illinois

Norton, Nancy Edith, Pace College Westchester-Ridgewood, New Jersey

Paterson, Gail Ann, West Virginia Wesleyan College-Lewisburg, Pennsylvania

Sister Patricia Ann Hottinger, Mary Rogers College-St. Louis, Missouri

Sister Ruth Marilyn Koseba, Marillac College-St. Louis, Missouri

Skinner, Sally, Simpson College-Chesterfield, Missouri

Stein, Toby Joanne, University of Kentucky-Philadelphia, Pennsylvania

Totten, Mary Lou Tipton, Arkansas City Junior College-St. Louis, Missouri

Wartey, Pamela Z., University of Missouri (Columbia)-St. Louis, Missouri

Williamson, Janet Elizabeth, Phillips University-St. Louis, Missouri

Zimmerman, Alice Margaret, University of Minnesota-Waseca, Minnesota

Junior Class 1970-71

Baker, Carolyn Josephine, B.A., Maryville College, '61-St. Louis, Missouri

Broemmelsiek, Mary Helen, University of Missouri (Columbia)-Defiance, Missouri

Brother Edward Francis McEnroe, Immaculate Heart College-Ojai, California

Crouse, Iva Louise, Iowa Central Community College-Fort Dodge, Iowa

Danner, Susan Marie, University of Missouri (St. Louis)-St. Louis, Missouri

Ditmanson, Barbara Jean, B.A., St. Olaf College, '67; M.A., San Diego State College, '69-Northfield, Minnesota

Ericsson, Jeanne Belle, B.A., University of Kentucky, '69-Joliet, Illinois

Garth, Nancy Ann, Wellesley College-St. Louis, Missouri
 Horowitz, Gail Ronnie, Washington University-Eastchester, New York
 Kopetti, Linda Geiselman, Millikin University-St. Louis, Missouri
 MacDonald, Cynthia Ann, Meramec Community College-St. Louis, Missouri
 Martens, Marguerite Elaine, B.S., Iowa State University, '41-Mt. Vernon, Iowa
 Meador, Carol Lynn, McPherson College-St. Louis, Missouri
 Monthei, Arlo Paul, Cornell College-Altoona, Iowa
 Schneeberger, Judy Ann, Belleville Junior College-Dupo, Illinois
 Schwartz, Richard Kenneth, Yale University-St. Louis, Missouri
 Sheridan, Linda Marie, Washington University, -Philadelphia, Pennsylvania
 Stone, Jeanne Elaine, University of Iowa-Burlington, Iowa
 Tyler, Claudette Lorraine, Forest Park Community College-St. Louis, Missouri
 Weeks, Virginia Carol, Valdosta State College-Valdosta, Georgia
 Wiedman, Sue Ellen, Northern Illinois University-Roanoke, Illinois
 Williams, Margaret Phillips, B.A., Smith College, '68-St. Louis, Missouri

PROGRAM IN PHYSICAL THERAPY

Senior Class 1970-71

Block, Frances Sue, University of Missouri-University City, Missouri
 Braznell, Julianne, Drake University-St. Louis, Missouri
 Brown, Gary Hamilton, Illinois State University-Janesville, Wisconsin
 Deichmann, Mary Barbara, St. Louis University-St. Louis, Missouri
 Elder, Carolyn Marie, Western Kentucky University-Morganfield, Kentucky
 Feltmann, Winlue P., B.A., Carthage College, '70-Wheaton, Illinois
 Ferguson, Karen Louise, College of DuPage-Liverpool, New York
 Freebersyser, Marilyn Jeanne, Hanover College-Webster Groves, Missouri
 Hollander, Leslie Karen, Washington University-Indianapolis, Indiana
 Lebo, Marlene Rae, Morningside College-Ames, Iowa
 Mann, Martha Dye Anne, Arkansas State University-Cherry Valley, Arkansas
 Newman, Gerald Kent, Morningside College-Sioux City, Iowa
 Nichols, Kathe Jean, Washington University-St. Charles, Illinois
 O'Malley, Susan Eleanor, Sweet Briar College-Rumson, New Jersey
 Russell, Linda Lee, Russell Sage College-Manitowoc, Wisconsin
 Schneider, Carol Ann, Ohio State University-Hubbard, Ohio
 Walden, H. Ruffin III, B.S., Tuskegee Institute, '65-Greensboro, North Carolina
 Walter, Peggy Lyn, Eastern Illinois University-Fairfield, Illinois

Junior Class 1970-71

Carlson, Christine Louise, University of Illinois-Chicago, Illinois
Carruthers, Daniel E., Kaskaskia Junior College-Ramsey, Illinois
Chase, Mary Catherine, University of Missouri-Webster Groves, Missouri
Fischer, Karen Kay, B.S., Iowa State University, '70-Marcus, Iowa
Fisher, Marye Jill, Ball State University-Greenwood, Indiana
Green, Leslie Ellen, Washington University-Dallas, Texas
Guder, Janna, Southeast Missouri State College-Kirkwood, Missouri
Halstead, Carolyn, Forest Park Community College-St. Louis, Missouri
Heim, Barbara Dean, Carson-Newman College-Jefferson City, Tennessee
Honey, Donald Eugene, Southwest Baptist College-Newburg, Missouri
Krishak, Thomas R., St. Petersburg Junior College-East Paterson, New Jersey
Limacher, Linda Kay, Washington University-South Milwaukee, Wisconsin
Marth, Janice Rose, Kaskaskia College-Centralia, Illinois
Mathews, Nancy Marie, University of Oregon-Woodburn, Oregon
Monson, Carol Lynn, Georgetown College-Independence, Kentucky
Morris, Ann Penn, Centenary College for Women-Belleville, Illinois
Smith, Diana Lynn, Lindenwood College-Clinton, Iowa
Steen, Nancy Helen, Washington University-Plainsboro, New Jersey
Topp, Kathryn Beth, University of Washington-Seattle, Washington
Wakefield, Alice Higgins, University of Washington-Mercer Island, Washington
Whitmer, Joalene, Brigham Young University-St. Louis, Missouri

SUMMARY OF STUDENTS IN THE SCHOOL OF MEDICINE 1970-71

Students of Medicine

Fourth-year class	92
Third-year class	101
Second-year class	96
First-year class	113
	<hr/> 402

Students of Health Care Administration

Second-year class	27
First-year class	35
	<hr/> 62

Students of Occupational Therapy

Senior class	15
Junior class	22
	<hr/> 37

Students of Physical Therapy

Senior class	18
Junior class	21
	<hr/> 39

Total students

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Washington University

All schools are located on the main campus at Lindell and Skinker Boulevards, St. Louis, Missouri 63130, except Medicine (660 South Euclid Avenue, 63110) and Dentistry (4559 Scott Avenue, 63110).

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

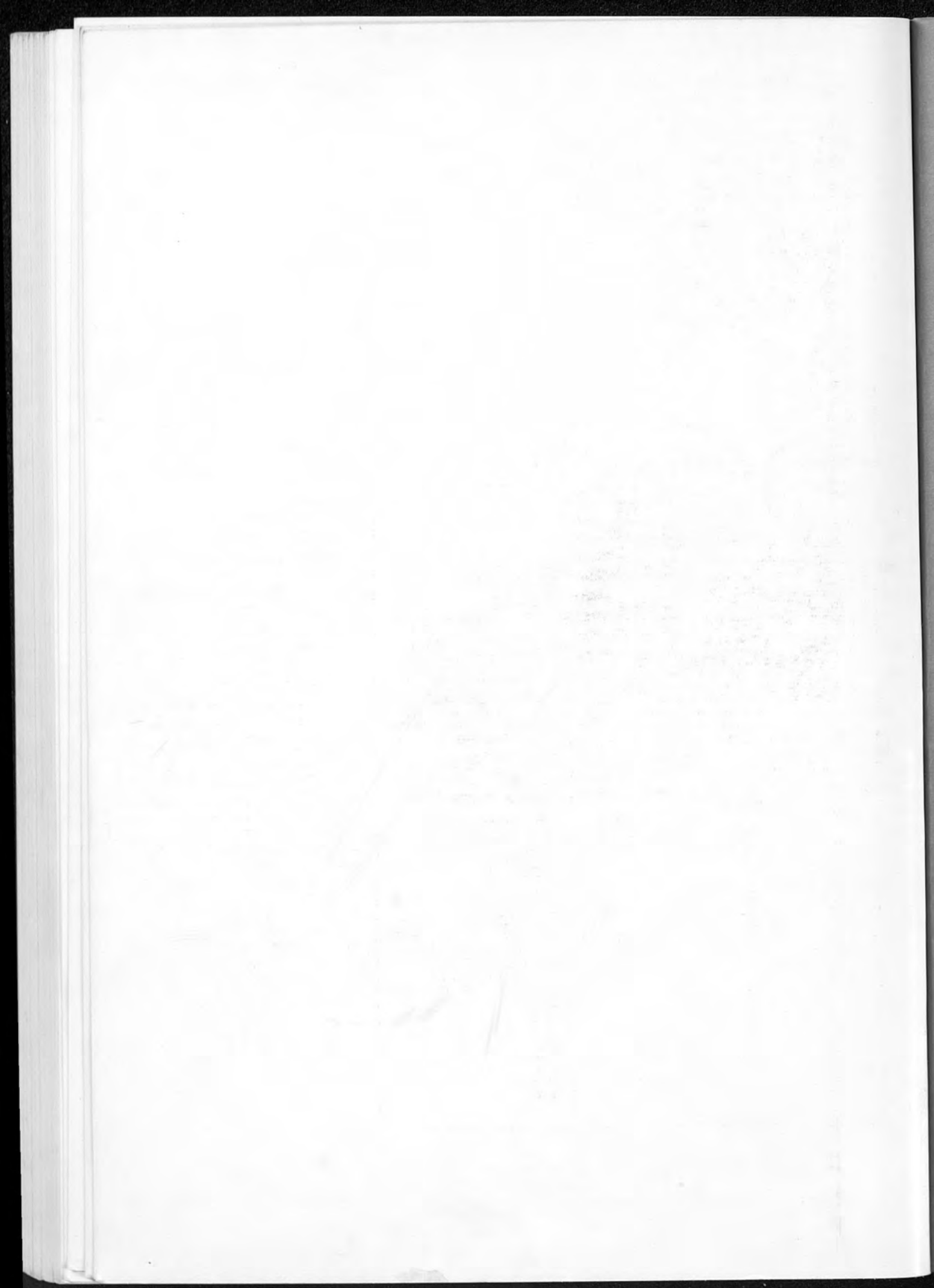
The School of Medicine

The School of Dentistry

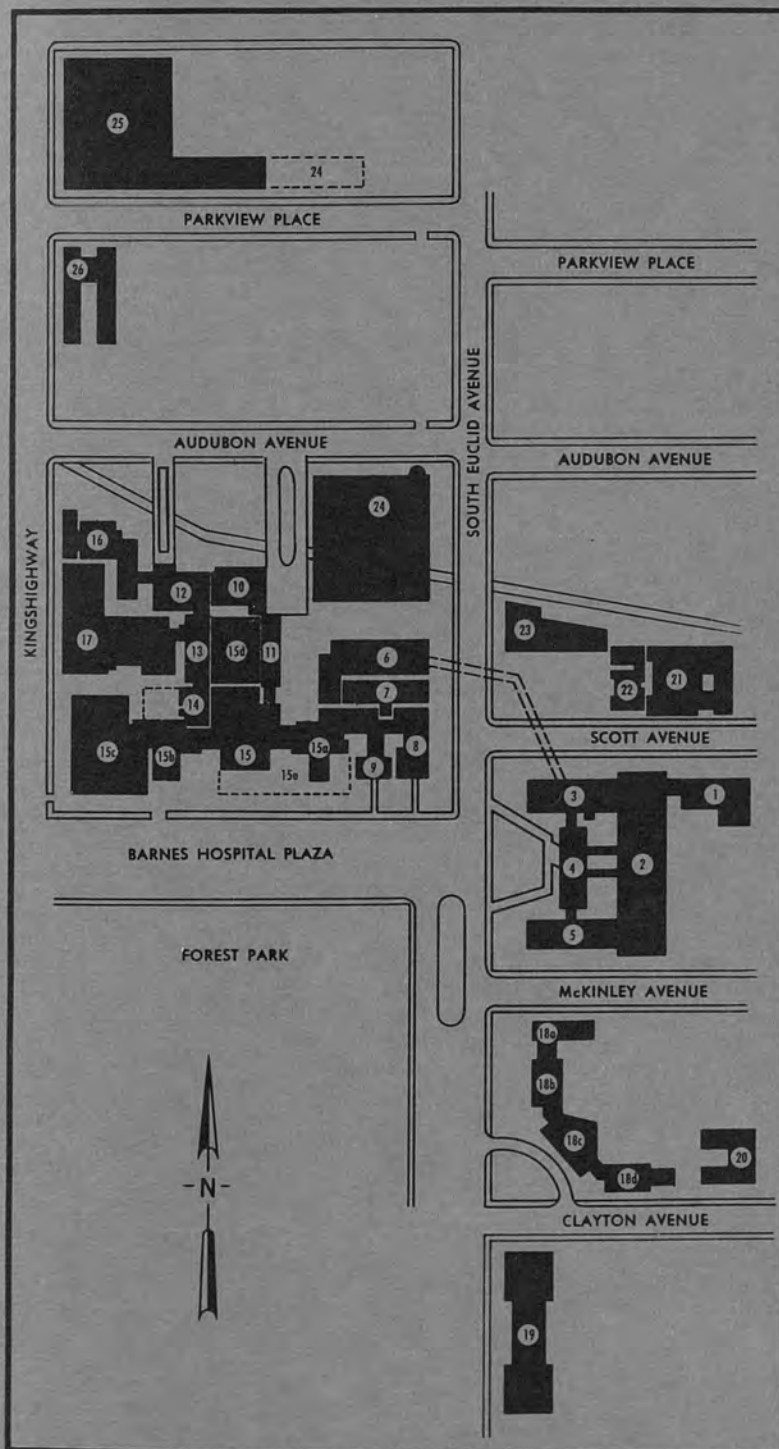
University College

The Summer School





WASHINGTON UNIVERSITY MEDICAL CENTER



- 1 Spencer T. Olin Residence Hall
- 2 McDonnell Medical Sciences Building
- 3 North Building (Auditorium, Library)
- 4 Cancer Research Building (Administrative Offices)
- 5 South Building (Basic Sciences Departmental Offices)
- 6 West Building (Pathology, Preventive Medicine, Animal Quarters)
- 7 Irene Walter Johnson Institute of Rehabilitation
- 8 McMillan Hospital and Oscar Johnson Institute for Medical Research (Neurology, Ophthalmology, Otolaryngology)
- 9 St. Louis Maternity Hospital (Obstetrics and Gynecology)
- 10 David P. Wohl, Jr., Memorial — Washington University Clinics
- 11 Renard Hospital (Psychiatry)
- 12 David P. Wohl, Jr., Hospital (Medicine and Surgery)
- 13 Barnard Free Skin and Cancer Hospital
- 14 Edward Malinckrodt Institute of Radiology
- 15 Barnes Hospital
 - a. Medical Wing
 - b. Rand-Johnson Memorial Surgical Wing
 - c. Queeny Tower
 - d. Diagnostic Laboratories; Service Center
 - e. East Pavilion (in construction)
- 16 Clinical Research Building
- 17 St. Louis Children's Hospital (Pediatrics)
- 18 700 and 724 South Euclid Buildings
 - a. Biomedical Computer Laboratory
 - b. Physical Therapy
 - c. Hospital Administration, Biostatistics
 - d. Computer Systems Laboratory
- 19 Central Institute for the Deaf
- 20 Central Institute for the Deaf Residence
- 21 School of Dentistry
- 22 Occupational Therapy
- 23 Power Plant
- 24 Parking Garages
- 25 Jewish Hospital
- 26 Jewish Hospital Nurses Residence

