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MEDICAL BULLETIN

UNIVERSITY OF *Minnesota*



in this issue

- DEPARTMENT OF OTOLARYNGOLOGY
- THE EDUCATOR AND THE PRACTITIONER
- BLOOD FLOW TO BONE
- STREPTOMYCES VENEZUELAE

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Special Article

The Department of Otolaryngology

The "Eye, Ear, Nose, and Throat" specialist was apparently an American creation stemming from the combined teaching of basic ophthalmology and otolaryngology years ago at some of our medical institutions. Volunteer clinicians did the teaching. Those in the separate private practice of ophthalmology and otolaryngology were found only in such large centers as Boston, New York, Philadelphia, and Chicago.

At the University of Minnesota, such combined teaching can be traced back to 1888, when the Medical School was in its first year of consolidation with the *Minnesota Hospital College*, the *St. Paul Medical School*, and the *Minneapolis Homeopathic Medical College*.

This is the third in a series of articles about the departments and divisions of the University of Minnesota Medical School. Next: The Department of Physiology.

Under Dr. Perry H. Millard, then Dean, the Medical School offered "Eye and Ear" in the third year of undergraduate study. (At

that time, tuition for the entire year was less than \$50.00 and a handful of professors did all of the medical teaching.)

Graduate study in these fields slowly emerged at Minnesota. Those who wished to specialize early in this century usually took training at Vienna or, as a second choice, at an American specialty hospital such as the Massachusetts Eye and Ear Infirmary, founded in 1827 and connected to the Massachusetts General Hospital.

Sometime prior to 1920, a two year program of combined training — a year in ophthalmology and one in otolaryngology — developed at the University of Minnesota. This arrangement continued until 1932. By that time, there was a trend toward separating the two specialties, and the Boards of Ophthalmology and Otolaryngology became the first two of the present 19 certifying Boards to be established.

In 1932, the program of graduate training in Otolaryngology and Ophthalmology was divided at Minnesota and each was expanded to two years.

Names of some of the early heads of ophthalmology and otolaryngology at Minnesota are perpetuated in the present University Medical Center. Perhaps the best known is **Dr. Frank C. Todd**, first head of the combined departments, for whom a wing of University Hospitals is named. The wing originally housed the Todd Memorial Room, which was later moved to its present quarters in the Mayo building, and is now used for departmental conferences. Dr. Todd succumbed to influenza in 1919 while on military duty during the epidemic of World War I.

Dr. William Murray was the next departmental head and served eight years. Ironically, he accidentally pricked a finger in 1927 while doing a mastoid operation for acute disease and died of septicemia several days later. His personal library was donated to the University, and now serves students and faculty of both otolaryngology and ophthalmology.

Dr. Frank E. Burch succeeded Dr. Murray as head of the combined department and head of the Division of Ophthalmology. At that time, **Dr. Horace Newhart** was appointed director of the Division of Otolaryngology. This leadership continued until 1942 when both men retired. Dr. Burch lived until 1957. In tribute to him, nearly a half million dollars has been contributed by former patients and friends toward an endowed professorship in ophthalmology at Minnesota.

Likewise, the Newhart Fund, for the enlargement of educational opportunities for residents in otolaryngology, was founded in Dr. Newhart's honor in 1942 by contributions of the staff, former students and his family.

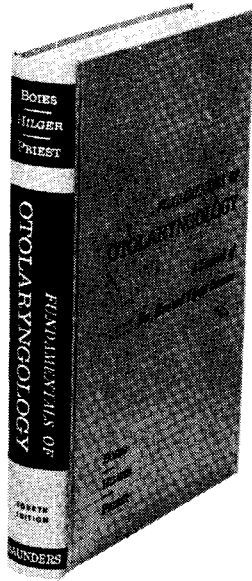
Dr. Lawrence R. Boies was named head of the division of Otolaryngology in 1942, and was appointed first full time head of the new Department of Otolaryngology in 1955.

THE UNDERGRADUATE TRAINING PROGRAM

Undergraduate medical students at Minnesota receive an elementary exposure to otolaryngology during their freshman year by doing anatomical dissections. A resident from the department collaborates with the Department of Anatomy in this teaching experience.

Second year students receive a single two-hour demonstration of physical diagnosis related to the ears, nose, and throat. In the Senior year, each student gets a total of 24 hours of lectures and demonstrations, and three weeks of "ENT" assignments during the Comprehensive Clinic training period. His time there is spent in the afternoon outpatient clinic held four

days each week. There is also a morning session of 90 minutes devoted to informal discussions, and Operating Room demonstrations held two days each week.



An elective period of 2 to 4 weeks is also offered but limited to three participants. Used in this teaching sequence is a textbook, *Fundamentals of Otolaryngology*, which is a product of the Minnesota program. Now in its 4th edition, the book is widely used in other medical schools. Royalties from its publication are placed in the Newhart Fund.

Residency training in otolaryngology at Minnesota was increased to four years in 1960, and now accommodates 16 residents. Four appointments are made in September annually to begin training on the following July 1. The first year is devoted to general surgery, and may be taken in any approved program. Most of the residents spend their first year at the Minneapolis V. A. Hospital.

The year in general surgery is followed by three years in Otolaryngology. Basic courses in anatomy, microbiology, physiology, pharmacology and pathology are covered during the first residency year. Special courses in clinical work are distributed through the other years.

Clinical experience is also gained by the student's rotation through at least two of the three other Otolaryngology Services that are affiliated with the University program. These are:

1. A St. Paul section serving (a) Ancker Hospital; (b) an Otolaryngological Research Laboratory at St. Joseph's Hospital; and (c) the Ear, Nose and Throat needs of the St. Paul Out-Patient Clinic, Inc.
2. The Minneapolis V. A. Hospital.
3. The Hennepin County General Hospital.

A senior resident is in charge of each of the four Services in Otolaryngology under staff supervision.

A RENAISSANCE IN OTOLARYNGOLOGY

The advent of the anti-microbial drugs (sulfanilamide in 1937 and penicillin 1942) probably changed the character of Otolaryngology more than any other specialty. Dr. Boies, present head of Minnesota's department, once remarked: "Prior to this change, we spent most of our time fighting pus."

The control of inflammation with these new drugs markedly reduced the use of surgical treatment of most of the suppuration in the upper respiratory tract, and otolaryngologists turned their attention to other problems. The one-stage fenestration operation for clinical otosclerosis became perfected. Better definition of hearing loss was possible with new tests and new electronic instruments, and hearing aids were improved for deafness problems not suitable for medical or surgical treatment.

Maxillofacial surgery for trauma made swift progress under the experiences of World War II. **Dr. Jerome A. Hilger**, a clinical professor at Minnesota, had an extensive experience in this work as a member of the University Hospitals group (Base Hospital 26) that saw service in England, Africa and Italy. He directs the present training in this segment of Otolaryngology along with **Dr. Albert Hohmann**, clinical assistant professor, who has both dental and medical training.

In recent years there has been a marked increase in maxillofacial injuries because of high speed transportation, industrial activity, and wider participation in such contact sports as football, basketball, hockey, and boxing.

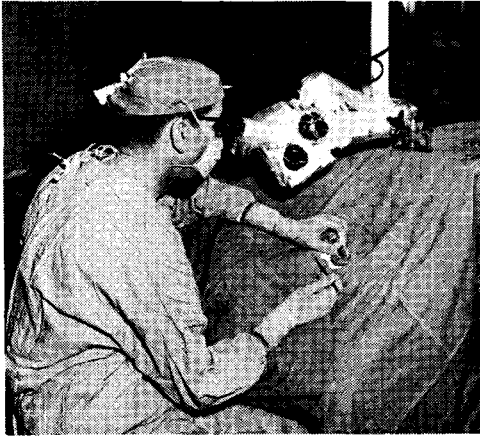
Out of this new experience the plastic reconstruction of the nasal pyramid became a new concept in the relief of obstructive nasal conditions formerly commonly treated by the overworked operation known as "submucous resection."

NEW DEVELOPMENTS IN EAR SURGERY

The last decade has seen great advances in the surgery that can be performed for the hearing loss caused by otosclerosis, and in the reconstruction of middle ear mechanisms damaged by diseases.

Using the operating microscope, it is possible to free the stapes immobilized by otosclerosis in some cases, or to remove it in most cases and substitute an artificial prosthesis. The results are excellent after removal of the stapes in more than 90% of cases ideally suited for this, when it is performed by competent hands.

Drumhead perforations and the sequelae of chronic middle ear disease are being repaired with increasing success by plastic



Dr. Robert Richardson, clinical instructor, peers through the microscope as he operates on a patient with otosclerotic hearing loss. This is done through the ear canal under local anesthesia with 16 diopters of magnification.

procedures. This operation is known as tympanoplasty. The operating microscope, improvements in graft materials through research, and antibiotic support helped bring about these advances.

Antibiotics have not lessened the activities with tumors of the upper respiratory tract or with broncho-esophagology. In fact these activities have increased because the antibiotic support as well as developments in anesthesiology have made possible more radical surgery and repair when indicated in certain malignancies. Likewise, the activities of the chest surgeon have made diagnostic procedures through the bronchoscope or esophagoscope more commonly performed.

Functional disorders in the upper respiratory tract have no doubt increased with the pace of modern living. This calls for more diagnostic acumen in the special examining procedures performed in the nasal space, pharynx and larynx.

RESEARCH

Research in Otolaryngology has kept abreast of the great increase in all fields of medical research during the last decade.

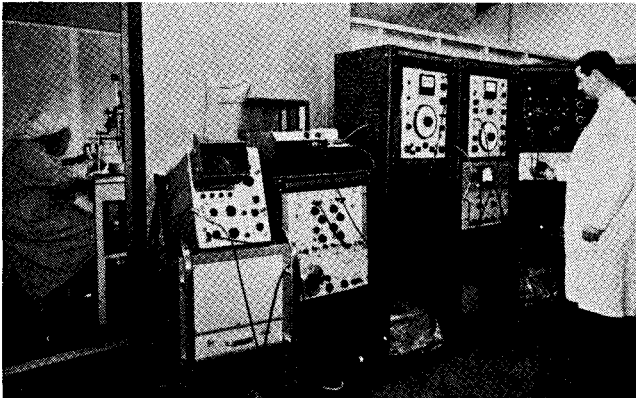
The growth and development of the Department at Minnesota has been substantially aided by grants from the USPHS (National Institutes of Health) and by the Dittman and the Swenson Funds.

In the description of the training program issued by the Department, prospective Otolaryngology residents find this definition of goals:

"Our primary objective of this training is to train potential leaders in the specialty who will contribute to its advance. The dearth of well trained modern Otolaryngologists and the below average quality of the training in a considerable number of our training centers impose the obligation also to train teachers and investigators. Our concept of the best type of training is to provide good clinical experience in a background of teaching and research."

To the question "why all this emphasis on research?" Dr. Boies replies: "The Otolaryngologist calls himself a *specialist*. That implies that he has superior knowledge of his subject. That can only be acquired and maintained through *inquiry*. Specialization is apparently stimulating most of the medical progress of today. If you train to become a specialist it is your obligation to try to play some role in the extension of our knowledge. One's contribution may be small but it all adds up. Furthermore, one who has an inquiring mind and exercises it will be a better physician and a better informed and more critical consumer of what he hears and reads."

All of the residents are encouraged to spend some time with otolaryngology research during their regular training. Others are encouraged to take a minimum of a year's additional training in preparation for teaching and research along with patient care.



A senior resident, Dr. Thomas Stengl, participates in a research project on the electrophysiologic nature of certain neural responses at the St. Joseph's Hospital Otolaryngological Research Laboratory in the St. Paul unit.

THE STAFF

A small core of full time Faculty and a large group of part time (clinical) appointees combine to carry out the undergraduate and graduate teaching programs and the research activity in Otolaryngology at the University of Minnesota.

Lawrence R. Boies, Professor and Head of the Department, was graduated from the College of Physicians and Surgeons of Columbia University in 1926. After internship, and 19 months of practice as an assistant to a general surgeon, he enrolled as a graduate student at the Harvard Medical School. This study, including a residency at the Massachusetts Eye and Ear, covered a period of 25 months. Dr. Boies was first appointed to the Minnesota faculty in 1931 on a half time basis. He continued in half time private practice until giving up the latter in 1955 to become the first full time head of Otolaryngology at Minnesota.

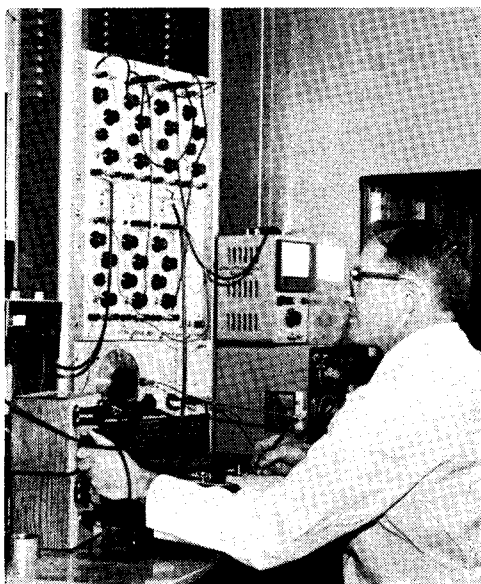
Dr. Boies has been active on the national scene in Otolaryngology, having served as president of the American Academy



Dr. Philip Affleck, a resident, consults Dr. Boies (left).

of Ophthalmology and Otolaryngology; the American Laryngological, Rhinological and Otological Society; and the American Otological Society. He is current President of the American Board of Otolaryngology.

Dr. Jerome A. Hilger received his undergraduate and graduate medical training at Minnesota and was first appointed



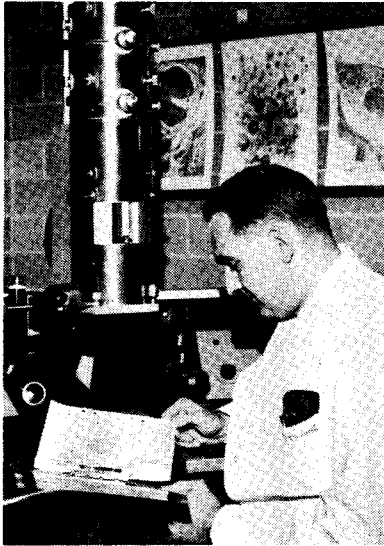
Dr. W. Dixon Ward, associate professor, conducts research on the effect of noise on hearing loss.

to the faculty in 1939. He directs all graduate teaching within the three units of the St. Paul section, and guides the work of the Otolaryngological Research Laboratory at St. Joseph's Hospital. This laboratory is supported by grants from the National Institutes of Health and the Hill Family Foundation. Dr. Hilger is presently a Director of the American Board of Otolaryngology, and is current chairman of the Residency Review Committee of the A.M.A.

Dr. Robert E. Priest is a 1932 graduate of the Medical School. He shares in the undergraduate teaching program and directs a graduate course in Broncho-Esophagology and Laryngology at University Hospitals. Dr. Priest was in general practice until 1938. After three years as a teaching fellow in residency training at Minnesota, he became a clinical instructor in Otolaryngology.

Dr. Henry L. Williams, Jr., former Head of the Ear, Nose and Throat Section at the Mayo Clinic, is in charge of the department's affiliated residency training program at Minneapolis V. A. Hospital. **Dr. Frank M. Lassman**, an expert on

Audiology and Speech, prepared for his special work at the University of Southern California. He was first appointed to the Department in 1953, and now directs the activities of the Audiology Clinic. **Dr. W. Dixon Ward**, associate professor, received his graduate degree in experimental psychology at Harvard University in 1953 and has since been engaged in research related to hearing loss. He was appointed to the Minnesota faculty in 1962 and is devoting full time to research.



Dr. Arndt J. Duvall, III, assistant professor, prepares to continue his studies with a recently installed electron microscope. He is a 1955 graduate of the Medical School.

Dr. Albert Hohmann received dental and undergraduate medical degrees at the University of Marburg in Germany. He completed his residency training in Otolaryngology at Minnesota in 1958. This was followed by 2½ years of additional training at Baylor University and the Henry Ford Hospital in Detroit, Mich. Dr. Hohmann was appointed to the Minnesota faculty in 1961. His research at the Otolaryngological Research Laboratory of St. Joseph's Hospital in St. Paul is supported by an N.I.H. grant. **Dr. Arndt J. Duvall, III**, completed his residency training at Minnesota in 1961. He then spent a year in research on an N.I.H. fellowship at the University of Iowa, and a second year at the Karolinska Institute in Stockholm, Sweden, where he learned electron microscopy techniques. Dr. Duvall was appointed to the full time Faculty on September 1, 1963.

THE MEDICAL BULLETIN

Dr. Melvin E. Sigel graduated from the Medical School at Minnesota in 1956 and has since completed a four year residency in Otolaryngology, and a year's N.I.H. fellowship in study of the larynx at the University of Zurich, Switzerland. Dr. Sigel is the most recent appointee to the Faculty (September 1, 1964) and is currently establishing a laboratory. He participates in undergraduate teaching at the University and graduate teaching at the Hennepin County General Hospital.

The complete roster of departmental faculty includes:

NAME	ASSIGNMENT
<i>Professors</i>	
Lawrence R. Boies, M.A., M.D.	University Hospitals
Frank M. Lassman, Ph.D.	University Hospitals
Henry L. Williams, Jr., M.D., M.S.	Minneapolis V. A. Hospital
<i>Clinical Professors</i>	
Jerome A. Hilger, M.D., M.S.	St. Paul unit
Robert E. Priest, M.D., M.S.	University Hospitals
<i>Associate Professor</i>	
W. Dixon Ward, Ph.D.	University Hospitals
<i>Clinical Associate Professor</i>	
Conrad Holmberg, M.D.	Minneapolis V. A. Hospital
<i>Assistant Professor</i>	
Arndt J. Duvall, III, M.D.	University Hospitals
<i>Clinical Assistant Professors</i>	
Benjamin Bofenkamp, M.D.	Henn. Co. General Hospital
John Glaeser, M.D.	Henn. Co. General Hospital
Albert Hohmann, M.D.	St. Paul unit
Bradley Kusske, M.D.	St. Paul unit
Douglas Kusske, M.D.	St. Paul unit
Kurt Pollak, M.D.	University Hospitals
Graham Smith, M.D., M.S.	University Hospitals
Harold Ulvestad, M.D.	University Hospitals
<i>Clinical Instructors</i>	
John R. Hilger, M.D.	St. Paul unit
John S. Huff, M.D.	University Hospitals
Malcolm Johnson, M.D., M.S.	Minneapolis V. A. Hospital
Robert L. Koller, M.D.	University Hospitals
Hyman M. Paisner, M.D.	Univ. & Henn. Co. Gen. Hosp.
Robert Richardson, M.D.	Minneapolis V. A. Hospital
Douglas C. Robertson, M.A.	St. Paul Unit
Melvin E. Sigel, M.D.	Univ. & Henn. Co. Gen. Hosp.
George V. Tangen, M.D., M.S.	University Hospitals

Staff Meeting Report

Mutual Responsibilities of the Medical Educator and the Practitioner*

J. Minott Stickney, M.D.†

It is a great pleasure for me to meet with you today at homecoming. A homecoming is just what the name implies, that is, a time at which those who have left the family return to renew acquaintances; a time when members of the medical faculty meet the students of former years, most of whom are engrossed in all the vicissitudes of medical practice. At such a time it seems appropriate to discuss some of the problems and responsibilities which should be understood and shared by all who are engaged in the education of the physician and the care of the patient. Ideally, all physicians must be concerned with the three major facets of medicine; namely, education, research and practice. Some of us find our greatest responsibilities in one or more of these spheres, but none can rightly ignore any of the three.



J. M. Stickney

As a representative of the Minnesota State Medical Association, I believe it is pertinent for me to mention a few of the problems which have been of interest recently to the Association and some of the implications of these matters.

THE HERITAGE OF EDUCATION IN MEDICINE

Historically, the physician in practice has always been interested in the education of the new physician. By the Oath of Hippocrates the physician pledged himself to pass on his knowledge. In frontier days the young man who aspired to be a practitioner attached himself to a preceptor, which meant that many physicians were also teachers. Dr. Victor Johnson, director of the Mayo Graduate School of Medicine and president of the Alpha Omega Alpha medical honor society, has emphasized in

*Presented to the Staff Meeting of University Hospitals, October 16, 1964.

†Section of Medicine, Mayo Clinic, Rochester, Minn. President-Elect, Minnesota State Medical Association.

a recent review the interest and discipline which from an early date the American Medical Association and the first-line medical colleges have brought to bear on standards of medical education. Substandard undergraduate schools have been either improved or eliminated. In postgraduate education the interest of the profession is manifested by its scrutiny of and salutary effect upon training programs by means of residency review and accreditation. To a greater extent than ever before, the practicing physician has come to accept the fact that his calling requires a lifelong educational process. The American Medical Association, in cooperation with other organizations, has engaged in a joint study of continuing education, culminating in the Dryer report, which has pointed out bold new approaches. The American Medical Association is at present reviewing the many postgraduate courses offered in all parts of the country, and has established a Citizens' Committee on Graduate Medical Education under the chairmanship of Dr. John S. Willis, president of Western Reserve University. The findings of this committee may do for graduate education what the Flexner report of 1910 did for undergraduate medical education.

The impetus toward certification for specialists who met certain standards of professional competence came from physicians in practice, and a diploma issued by one of the certifying boards is now accepted as the single best evidence of such competence. True enough, all these efforts have been aided in large measure by educators affiliated with university faculties, but none of the ventures could have been successful without the interest, support and self-discipline of the practicing physicians reflected by their participation in medical education at all levels and throughout their lifetimes. More materially, acting through both state and national medical associations, practicing physicians are both encouraging and assisting medical students and residents by the establishment of loan and scholarship funds.

Against this background I should like to point out a few of the problems in the relationships of medical educators with practitioners which have come to the attention of those of us who feel obliged, because we have been entrusted with offices in organized medicine, to attempt to represent all sectors of the profession. Some describe these problems as "the town vs. gown syndrome," but I view them in the light of growing pains during the inevitable progress of a complex medical community.

INTERNS IN PRIVATE AND MEDICAL-CENTER HOSPITALS

In 1961, medical school-affiliated hospitals had 5,418 positions approved for internships, of which 4,468 were filled. This

was a 15 percent increase over the 10-year period from 1951 to 1961. Nonaffiliated hospitals had 6,656 approved positions open, of which 3,705 were filled. This was a decrease of 7 percent for the same period. In 1951 there was an equal number of interns in affiliated and nonaffiliated hospitals. Summaries show that while the positions available in each category increased by 20 percent, the affiliated hospitals were three times as successful over the 10-year period in attracting eligible graduates. Although it may be charged that university-affiliated hospitals were attracting more interns than they could use, the 950 unfilled positions which remained in 1961 and the additional fact that the ratio of interns to beds in affiliated hospitals was 1:31, seems to refute this charge. The ideal ratio is 1:20. This, of course, does not make any more palatable the knowledge that the nonaffiliated hospitals had a much higher proportion of unfilled positions with an intern-to-bed ratio of 1:53. Whereas the affiliated hospitals secured 93 percent of their interns through the National Intern Matching Program, the nonaffiliated hospitals recruited only 50 percent in this manner. The inference would be that most of the remaining positions were filled by foreign graduates.

In residency programs in 1961 the affiliated hospitals filled 17,629 of 20,129 openings, whereas the nonaffiliated institutions filled 11,865 of 14,998. Thus, there were only 29,494 residents for 35,127 approved positions.

I present these figures to show the magnitude of the problem and not to minimize the concern of those in the practice of medicine outside the precincts of the university teaching program. We must all work together for a satisfactory solution.

RESEARCH VERSUS PRACTICE

Medical faculties are said to influence unduly young physicians toward a program of research, not only because of the intrinsic interest and attraction in research, but also because of the substantial sums now available in the form of grants-in-aid. An analysis of medical graduates showed that, whereas in 1959 13 percent of the 1935 graduates were in education and research, in the same year 26 percent of the 1950 graduates were so engaged. Increasing numbers of young men and women with the degree of doctor of medicine are electing to pursue a career of investigation. At the same time, the obvious obligation of the medical schools to provide physicians for the care of the sick and the maintenance of health cannot be ignored. There is no agreement on the question of the number of practicing physicians necessary for this purpose. Statistics are available which

suggest that the average physician in daily practice is forced to see more and more patients. Although it has been assumed that the increase in the number of patients the private physician sees has caused deterioration of the quality of care, there are other factors which make this assumption debatable. Perhaps all these observations simply revert to the problem I first mentioned, which is the inadequate supply of medical students for whose services the competition between research and practice is so keen.

Some observers are critical of the admission policies of medical schools, in respect to both number and analysis of the qualifications of applicants. You are no doubt aware of definite plans for several new medical schools and the persistent discussion about others. At state as well as national levels deliberation about these matters should be unhurried and exhaustive, so that conclusions will be sound. It seems to me that there is an opportunity in Minnesota for the state medical association to assist in the solution of these problems.

CHANGING ENVIRONMENT OF THE GENERAL PRACTITIONER

The distribution of physicians in our state certainly is related in part to the number available, but the difficulty goes much further. Other factors are also of very great and perhaps supervening importance. For instance, the mobility of our people, the increased knowledge of the physician, the complex tools now needed to implement this knowledge, and the physician's desire to provide that quality of care which his education has taught him to administer are molding a new organization of service. One of your alumni, Dr. William F. Maloney, described this very well in a Minnesota Medical Foundation address of 1963. (*The Wild Blue Yonder*, Univ. of Minn. MEDICAL BULLETIN, 35:58-71, October.) In this milieu, concepts of what the family physician should be are changing. We must provide sympathetic, complete care for the patient. The general practitioner in Minnesota has carried out his functions with distinction, satisfaction, and a high degree of competence. In a state which has large rural areas he has been indispensable, and in our cities he has given his families sound ministrations, confidence and security. He brings his problem to the medical association and to you. We certainly cannot and would not dismiss him as no longer necessary — the need for his services is greater than it has ever been. He asks that you explain to your students the opportunities and the deep personal satisfaction inherent in general practice, and he asks that members of your house staff be made aware of his problems. There are times when an

unguarded statement or reference may unintentionally destroy confidence of the patient in his general physician. This is almost always inadvertent, which means that it can be prevented by the exercise of prudence. The general practitioner, on the other hand, needs to be less defensive. He has every reason to be proud of what he does and how he serves his community. I believe that he expects, and he surely deserves, our respect for his contributions to the medical scene. He well earns the dignity of his profession. For the future he wishes to see, I think, a medical practice developed in which the prime concern of the profession is preservation of what he represents, namely, readily accessible, eminently satisfactory care for the patient with full knowledge of where and how to obtain the help necessary to meet any problem.

OTHER PRACTITIONERS AND TRADITIONAL MEDICINE

At Homecoming time in 1958, Dr. Horatio B. Sweetser spoke to you about the influence of all types of practitioners upon the health services to the public. The cultists and the poorly trained have always preyed upon the fancied grievances or the credibilities of those patients who have been ignored by, or become disenchanted with, the regular physician because of his seeming unavailability or disinterest. Our objective is to ensure that all who need the services of a qualified physician will be able to obtain them. In the last year Minnesota statutes have been altered to grant unlimited privileges to recently graduated osteopathic physicians when these are licensed by the Minnesota State Board of Medical Examiners. This board now has an osteopath among its members. Those osteopaths who hold a limited license may, upon completing additional training and passing the board's examination, be granted an unlimited license. Integration of the osteopath into hospital practice is proceeding. The effects of these changes undoubtedly will be felt in the postgraduate courses which you provide. At the same time, the increasing demands of the chiropractor for more extensive ventures into medical practice are now before us.

PATIENT, MEDICAL SCHOOL AND PRIVATE PRACTITIONER

In many states the conflict still rages between university and private practitioners with respect to availability of patients, both charity and private. In Minnesota it is a pleasure to be able to dismiss this problem with a compliment to the medical faculty for good professional relationships. We are fortunate that the University of Minnesota Medical School was established early and grew to eminence with the Twin Cities and the state. The

Minnesota State Medical Association hopes to join with you in the celebration of the 75th anniversary of the Medical School in 1965.

MEETING THE COSTS OF MEDICAL CARE

I should like now to turn to some matters of economic importance. Perhaps the way in which the public pays for its medical care is not of immediate concern to the educator, but it is a very real problem to physicians in practice, and in many ways it is of increasing interest to those in university medicine. I do not need to remind you that the last 25 years have brought great changes in the economics of medical care. In 1937 Minnesota physicians, through their state association, organized Minnesota Blue Shield and created it as an independent body controlled by physicians. It was agreed that a service type of prepaid care would be provided for those with low incomes. About the same time private insurance companies became interested in health insurance. The story of the phenomenal growth of both types of insurers is well known to you. Yet, concomitantly with this growth of both service and indemnity contracts, the costs of medical care have increased enormously, not only because of inflation and increased wages, but because of the expense of obtaining and then applying the vast new knowledge which medical research has brought to us. All these factors have exerted new effects upon our practice. Patients who were once classified as indigent or charity patients and who therefore were available to the teaching hospital are now considered to be private patients and are not so readily available for investigation or teaching. Most institutions have found, however, just as you have, that private patients of all types can be brought into investigational and teaching programs which are now spreading to hospitals never before engaged in such endeavors. Since the cost of medical care for many of these patients is covered by insurance, questions arise as to what charges are proper and to whom the income should accrue. When indemnity coverage prevails, payment goes to the patient, and his contract is with the physician or hospital, but when service contracts are applicable the situation becomes complex. Minnesota Blue Shield, with most of the other state Blue Shield plans, has raised questions of this nature and has discussed them with the Minnesota State Medical Association. For example, if a resident performs a service, who is to receive the compensation for it? Does it go to the resident, the hospital or to that member of the staff who has accepted supervisory responsibility?

I am by no means proposing that the proper answers are at

hand, but I know from discussions at local, state and national levels that the several interested parties will be called upon to reach some satisfactory agreement. These are only a few examples of the problems introduced by the need for proper disbursement of the funds made available from service and insurance benefits. Just as difficult is the problem of equitable adjustment of fee schedules to the value of the service rendered. This is reflected in the constant discussion and adjustment of relative-value fee scales.

One aspect of the many problems involved in fees for medical care is also of particular interest to those of us who engage in research and teaching. Studies have shown that identical illnesses cost an insurer much more when the patient is confined to a research and teaching hospital than when the patient is treated in an unaffiliated hospital. This is usually the result of expensive laboratory work carried out in the research and teaching hospital. I believe that those hospital charges which do not relate directly to superior care should be borne by funds other than those made available by insurance.

Those of you who read the pages of your medical journals devoted to socio-economic problems or the publications given over exclusively to this subject are aware of the constant efforts toward control of the extent and quality of medical care in hospitals. We have maintained Tissue Committees for many years, and few doubt their salutary effects upon surgical practice. Hospital staffs are now struggling with proposals for review of the quality of medical work and the need for and length of hospitalization. All the proposed plans for the provision of tax-supported care for the aged have included a utilization committee as a requirement for participation. The Minnesota State Medical Association has encountered widely divided opinions about the efficacy of review and utilization committees. Obviously, changes of this nature must be considered in the light of justice for all viewpoints, including the legitimate interest of the public, so well described by Mr. Atherton Bean in his address to the Minnesota Medical Foundation in 1962. (*My Grandson—Your Patient*, Univ. of Minn. MED. BULL., 35:58-68, October.) This same attitude must prevail in the field of area-wide hospital planning. State and national medical associations are insisting that these decisions about the quality and extent of medical and hospital care be reached in a voluntary manner, so far as is possible, and by parties thoroughly cognizant of the needs and also capabilities of the local community.

GOVERNMENT MONIES IN PAYMENT FOR MEDICAL CARE

Perhaps it would make my task much easier if I chose not to mention the political arena. The many scientific accomplishments of organized medicine at all levels are recognized and seldom debated. But the benefits of these same achievements must be made available to all our people. No one argues this point; we differ only in the matter of the methods to be employed. It is understandable that in an academic atmosphere the physician in a medical center may not be so concerned as the physician in private practice about the effects of those measures which tend to bring tax-supported funds into the scheme of payment for medical service to an increasing number of our population. I do not ask that you quickly support one side or the other, either in blind adherence to tradition or in unreasoning assumption that all such proposals are needed and progressive. I do ask that you become an interested and informed participant and that you provide your students with a complete picture of medicine's economic problems. Scholarly deliberation and conclusions are essential if we really believe in the often-quoted cliché: "Medicine must get its house in order." We can all agree that freedom and opportunity to carry out and apply the very best research, education and patient care are of prime importance. However else we may differ, we can and should tell the story of good medicine to the American public.

CONCLUSION

I have tried to present a number of problems and a few suggestions for the solution of these problems. In conclusion, I wish you to know that the Minnesota State Medical Association appreciates your continued and, I hope, expanded participation in its affairs. We welcome members of your staff to membership, and this invitation includes a residency membership for those in training.

Staff Meeting Report

Determination of Blood Flow to Bone *

William J. Kane, M.D.†

Eugene Grim, Ph.D.‡

Blood flow to bone may be determined in experimental animals by the fractional distribution of radioactive potassium (K-42) or radioactive rubidium (Rb-86). This method of flow determination has been validated by means of the simultaneous collection of total venous outflow from the hindlimb, analysis of flow distribution and by the mathematical analysis of radioactivity curves of arterial and venous blood. More direct methods of validation have been made virtually impossible because of the multiplicity of vessels supplying and draining the bone.

Basically, the K-42 or Rb-86 methods are applications of the clearance principle; after the rapid injection of a bolus of isotope into the vena cava, the arterial isotope values are determined by the simultaneous, continuous radiation monitoring of arterial blood which provides an arterial isotopic dilution curve from which the cardiac output can be calculated by the standard Stewart-Hamilton procedure.

Sacrifice of the animal 60 seconds later and subsequent analysis of the desired tissues enables one to ascertain what fraction of indicator injected can be found in those tissues. Then, assuming that the fraction of injected isotope found in the bone is equal to the fraction of cardiac output perfusing it, the blood flow to the bone is easily calculated:

$$\text{organ blood flow} = \text{cardiac output} \times \frac{\text{organ indicator content}}{\text{total indicator injected}}$$

If every organ of the body extracted 100% of the isotope brought to it by the blood, this assumption would be correct. Unfortunately, no organ extracts 100%, and many remove much less. Thus, the method must be validated for each organ whose blood flow is to be studied.

*From a report to the Staff Meeting of University Hospitals on December 11, 1964

†Instructor, Division of Orthopedic Surgery

‡Professor, Department of Physiology

Isolation of canine hindlimbs except for the femoral artery and vein by means of high thigh amputations or by the use of wire tourniquets which encompassed all tissue except the femoral vessels insured that all blood flowing into and out of the limb passed through these two vessels. A polyethylene "T" tube was inserted into the femoral vein so that clamping of the central segment and opening of the external segment would allow quantitative collection of all venous return. Total limb flow was measured simultaneously by collection of venous return and by the isotope clearance technique. In 19 experiments with limbs isolated by tourniquet the mean venous return was 46.8 ml./min. while flow calculated from K-42 clearance was 50.0 ml./min. For limbs isolated surgically venous outflow collections in six animals gave an average of 78.0 ml./min. as compared with 73.0 ml./min. as determined with K-42. In five similarly prepared animals, the venous outflow was 80.0 ml./min. and Rb-86 clearance was 83.7 ml./min. The average discrepancy between venous outflow measurements and isotope clearances was 7%.

In the same experiments, isotopic analysis of the venous blood permitted construction of venous radioactivity curves for comparison with the arterial dilution curves. From such curves, it was seen that approximately 15% of the isotope reaching the hindlimb was lost in the venous blood during the 60 sec. experiment; but this lost isotope was almost exactly replaced by the re-circulated isotope coming from other organs whose extraction was considerably less than 100%. Thus, the hindlimb contained an amount of isotope equal to that it would have contained if its extraction ratio and the extraction ratio of all other organs had been precisely 100%. On the basis of this observation and the agreement of the total venous outflow with the calculated flow from the isotopic clearance data, it was concluded that the clearance of K-42 or Rb-86 correctly measures the blood flow to the whole hind limb.

Even though the method works with the limb as a whole it is possible that it does not give correct flow values for the bone within the limb. For example, the bone might have a lower extraction ratio than the muscle; hence, bone blood flow would be underestimated while muscle blood flow would be overestimated. It was, therefore, necessary to determine if the distribution of the isotopes within the limb was the same as the distribution of the arterial blood flow. To do this Rb-86 distribution was determined simultaneously with the distribution of arterially injected Na-24 labelled glass microspheres of 16 or 25 μ diameter which are known to be 100% cleared by the capillary beds of tissues. Analysis of the bone, muscle, and skin

THE MEDICAL BULLETIN

of the hindlimb for both isotopes in 14 experiments gave the results shown in the table.

TABLE

	<i>Bone</i>	<i>Muscle</i>	<i>Skin</i>
Rb-86	17.9%	69.2%	12.9%
Na-24	15.3%	71.4%	13.3%
(Total hindlimb flow equals 100%)			

The close agreement of the distribution of the radio-rubidium and the microspheres is strong evidence that both correctly measure the distribution of the arterial blood flow to these three tissues within the hindlimb. From such data, it is possible to calculate the blood flow per gram of each of these three tissues. These values were: bone 0.11, muscle 0.05 and skin 0.09 ml./min. -gm. in anesthetized animals.

It was concluded that the clearance of either radio-potassium or radio-rubidium provides a valid measure of blood flow to the long bones of the hindlimbs of the dog.



Staff Meeting Report

Structure and Composition of *Streptomyces venezuelae* *

S. G. Bradley, Ph.D.†

In order to understand the ecological, genetical and physiological interactions of an organism, it is necessary to have a meaningful appreciation of its structure, organization and chemical composition. As a subject for such studies, the author has chosen the streptomycetes, that group of branching, filamentous bacteria that produces most of the clinically useful antibiotics. My colleagues and I are striving to correlate structure, composition and function in three complex biological processes: actinophage multiplication, antibiotic production and genetic control mechanisms. Each of these systems is in turn divisible into several rather discrete problems; for example, actinophage multiplication involves specific attachment to the cell surface of the host, penetration, vegetative growth, maturation and lysis. Similarly, antibiotic production can be separated into distinct stages: growth of cells, cessation of growth and initiation of antibiotic synthesis, the productive period and finally, death. Genetic control includes storage of information, translation into physiological activity and regulatory phenomena.

This paper is concerned with results obtained with *Streptomyces venezuelae*. This microbe, like other streptomycetes, is of particular interest because it possesses two types of growth: (1) a vegetative mycelium embedded in the nutritive substrate, and (2) an aerial mycelium bearing spores.

The spores of *S. venezuelae* differ from the vegetative mycelium in susceptibility to actinophages and in the arginine and leucine contents of the total cell-proteins. Unlike the spores of *Bacillus*, streptomycete spores are not appreciably heat resistant, and they serve as disseminative, reproductive bodies. The spores do withstand desiccation. The exterior of the spore of *S. venezuelae* is inlaid with a crystalline lattice; the elongate crystals

*From a report to the Staff Meeting of University Hospitals on December 4, 1964, and supported by grant AI-01601 from U.S. P.H.S.

†Professor, Department of Microbiology

can be removed with benzene. This coating probably accounts for the hydrophobic characteristics of the spores. Underneath the thick spore wall lies the plasma membrane. The cytoplasm contains internal membranous bodies, some of which are connected to the plasma membrane. The germ plasm, which contains a single set of genetic information, is not separated from the cytoplasm by a nuclear envelop.

The walls of the vegetative hyphae are chemically similar to those of gram-positive eubacteria. They contain the amino sugars glucosamine and muramic acid, and the amino acids alanine, glutamate, glycine and diaminopimelic acid. Although lysozyme will disrupt *S. venezuelae* hyphae, the isolated walls are not dissolved, probably because the teichoic acid contributes to the structural integrity of the wall. Several antibiotics strikingly resemble wall components; e.g., kanamycin, streptomycin and paromomycin. It is reasonable to speculate that these antibiotics are liberated as a result of overproduction of a normal cell constituent or are released as a result of degradation of cellular structures. It should be noted that most antibiotics are produced only after cell proliferation has ceased.

A correlation between ability to produce an antibiotic and sensitivity of productive strains to particular actinophages has been reported in a few instances. Indeed, if some antibiotics are structural components of the cell surface, it is not surprising that they are, in some instances, integral components of phage receptor sites.

The internal membranous bodies, some of which arise from the plasma membrane may be vesicular or whirled. The early notion that bacteria are bags of enzymes must now give way to a compartmentalized model in which membranes serve not only as barriers but as surfaces and channels which determine the rate of enzymic reactions and the interactions between enzymes.

The germ plasm of the vegetative hyphae is an elongate, contorted, centrally-placed area of lower electron density than the cytoplasm, as viewed in the electron microscope. Because there is no limiting nuclear membrane, it is obvious that in syncytic recombination, cell fusion is tantamount to nuclear fusion. The deoxyribonucleic acid of the streptomycetes ranges from 34% guanine, 34% cytosine, 16% thymine and 16% adenine to 37% guanine, 37% cytosine, 13% thymine and 13% adenine. It is not surprising, in view of the similar gross composition of the deoxyribonucleic acid, that interspecific syncytic recombination is not rare.

In summary, a concurrent study on the structure and com-

position of the streptomycetes has provided insight into the biology of actinophage reproduction, antibiotic production and the recombinational processes.

The author wishes to thank Barbara Painter and W. J. Cooney for their collaboration in this work.

Staff Meeting Report

Human Anti-gamma-globulin Factors Reacting with L-chains

Ralph C. Williams, Jr., M.D.†

Evidence that the rheumatoid factors found in human sera which react with human γ -globulin as in the latex fixation test are actually antibodies, has been recently accumulated. One important aspect of this evidence involves the experiments which have shown that human anti- γ -globulin factors or rheumatoid factors behave like antibodies directed against many separate sites on the human γ -globulin molecule. Human 7-S γ -globulin is known to be composed of two H-chains and two L-chains—the chains being joined by three interchain disulfide bonds.

Most human anti- γ -globulin factors, including 19-S rheumatoid factors, have shown primary reactivity with sites on the H-chains of γ -globulin. However, some sera of human origin and extra-rheumatoid source show specificity for sites on L-chains of human γ -globulin, notably the 19-S anti-Inv (a) or anti-Inv (b) agglutinators. Selected sera from patients with rheumatoid arthritis show agglutination reactions with isolated human L-chains tanned to cells. These reactions were studied in greater

*From a report to the Staff Meeting of University Hospitals on November 27, 1964.

†Assistant Professor, Department of Internal Medicine.

detail by testing the reactions of a panel of sera from rheumatoid arthritis patients with individual L-chains isolated as Bence-Jones proteins from patients with multiple myeloma.

Eleven Bence-Jones proteins representing L-chains from individual patients were purified and isolated by starch block electrophoresis, followed by separation in 5-20% sucrose density gradient or by gel filtration using Sephadex G-100. These steps were necessary to rid the preparations of any traces of H-chains or of whole 7-S myeloma protein. The individual isolated Bence-Jones proteins were affixed to carrier red blood cells by tanning and their reactions studied with a panel of 15 sera from rheumatoid arthritis patients.

A striking diversity of over-all reactions of the panel of rheumatoid arthritis sera with individual light chains was noted. Of interest was the finding that agglutination reactions between rheumatoid arthritis sera and L-chains (individual Bence-Jones proteins) could not be inhibited by whole 7-S γ -globulin but only by isolated L-chains or Bence-Jones proteins. The reaction with L-chain sites, therefore, appeared to be directed at relatively buried determinants only available for reaction after interpolypeptide chains disulfide bonds had been broken.

Of particular interest was the finding that in most instances, the reactions between L-chains and rheumatoid arthritis sera bore no apparent relationship either to the Group I or II determinants of the Bence-Jones proteins used or to their genetic typing in the Inv (a) system, where the determinant is known to be located on L-chains. Indeed apparent subgroups of L-chain determinants within a particular group and Inv (a) type were apparent. This was demonstrated by inhibition experiments using as inhibitors Bence-Jones proteins different from those tanned to the cells along with one or several agglutinating sera.

The variable pattern of reactivity between the panel of rheumatoid arthritis sera and individual L-chains, or Bence-Jones proteins, tested here might be expected from what is already known concerning the multiplicity of reactive sites on the whole 7-S γ -globulin molecule. It is surprising that multiple and antigenically disparate sites on isolated L-chains show reactions with human anti- γ -globulin factors since the F-fragment or H-chains contain many of the major antigenic determinants of human γ -globulins.

Medical School News

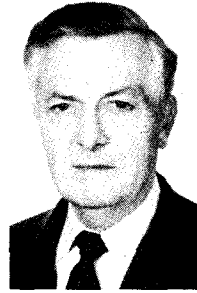
DR. GERALD T. EVANS HONORED IN 25th YEAR ON MINNESOTA FACULTY

A full and rewarding career and 25 years of service to the Medical School were noted November 20-21, 1964 when associates and friends honored Dr. Gerald T. Evans, professor and head of the Department of Laboratory Medicine.

The event included a Silver Anniversary symposium, presented in Dr. Evans' honor by his Department. Eighty two former students and colleagues returned for the occasion, and greetings from well wishers were received from around the world.

Canadian-born and educated, Dr. Evans attended the University of British Columbia and received his medical degree from McGill University. He also earned a Ph.D. at the University of Pennsylvania and was on the faculty at Yale before taking the post of Director of Clinical Laboratory Service in 1939 at the University of Minnesota.

Dr. Evans anticipated very early the need for high-quality laboratory services at the University Medical Center, and was the person principally responsible for developing Minnesota's strong teaching programs and training in medical technology and clinical pathology. Of his work, Dr. Robert B. Howard, Dean of the College of Medical Sciences, said: "At this institution Dr. Evans has brought laboratory science to the status of a true academic discipline. Perhaps even more important has been his role as adviser to younger colleagues and students, and his refusal to accept the methods of the past as unalterable institutions."



GERALD T. EVANS

MINNESOTA MEDICAL FOUNDATION

STATEMENT OF CONDITION*

As of June 30, 1964

ASSETS

	June 30, 1964	Sept. 30, 1963
Current Funds		
Unrestricted		
Cash on Hand	\$ 5.00	\$ 5.00
Cash in Bank—Checking Account	7,293.42	5,472.24
Cash in Bank—Savings Accounts and Certificates	12,230.52	
Executive Office Account with University of Minnesota	(352.45)	468.46
Note Receivable	209.40	203.31
Restricted		
Cash in Bank—Checking Account	12,398.10	46,741.39
Cash in Bank—Savings Account and Certificates	24,725.36	
General Agency Investment Account	19,267.45	29,970.64
Total Current Funds	\$ 75,776.80	\$ 82,861.04
Endowment Funds		
Cash in Bank—Savings Accounts and Certificates	\$ 43,613.59	\$ 35,525.05
General Investment Account	111,649.04	109,342.05
Total Endowment Funds	\$350,719.34	\$341,600.59
Medical Research		
Investment Account	195,456.71	196,733.49
TOTAL ASSETS	<u>\$426,496.14</u>	<u>\$424,461.63</u>

MINNESOTA MEDICAL FOUNDATION — 1964

In 1964, the Minnesota Medical Foundation advanced the closing date of its fiscal year by three months from Sept. 30th to June 30th, to conform with the business year of the University of Minnesota.

Thus this year's audit, printed above, represents nine months of business activity only.

Nevertheless, the Foundation realized a slight growth in assets while continuing to provide substantial grants for scholarships, research, teaching awards, and other timely needs of the University of Minnesota Medical School.

Gifts and payments of membership dues to the Foundation during the 9-month period, from alumni, other doctors, private

MINNESOTA MEDICAL FOUNDATION

STATEMENT OF CONDITION*

As of June 30, 1964

FUND BALANCES

	June 30, 1964	Sept. 30, 1963
Current Funds		
Unrestricted Funds	\$ 19,385.89	\$ 6,149.01
Restricted Funds	56,390.91	76,712.03
	\$ 75,776.80	\$ 82,861.04
 Endowment Funds		
Unrestricted Funds Serving as		
Endowment	\$ 40,556.86	\$ 40,556.86
Scholarship Endowment Fund	5,199.00	4,324.00
Other Endowments	304,963.48	296,719.73
	\$350,719.34	\$341,600.59
 TOTAL FUNDS	\$426,496.14	\$424,461.63

*Audit by Theodore Stark & Co., Certified Public Accountants,
Minneapolis, Minnesota.

citizens, corporations, medical organizations, medical clinics, and foundations, plus investment earnings, amounted to \$119,680.26. During the same period, the Foundation had expenditures of \$117,645.75 in grants, transfers of earmarked gifts to the University of Minnesota, and operating expenses. The latter totalled \$18,595.32.

Entering its 25th year of service to the Medical School, the Foundation lists assets of \$426,496.14, which has been donated to it over the years by alumni, friends, and other benefactors. Some of the highlights of 1964:

- Awarding of \$30,775 in scholarships to 58 deserving medical students, and growth of the Scholarship Endowment Fund to about \$100,000.

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- *Loaning of approximately \$22,000 in emergency short term loans to medical students with no interest charges.*
- *Awarding of two Distinguished Teaching Awards, including cash prizes of \$1,000.00 each, to Dr. M. John Murray, and Dr. Kenneth Osterberg of the Medical School faculty. Cash prizes are provided by the Minnesota State Medical Association.*
- *Issuance of 11 more research grants worth \$11,320.00 to young faculty members and medical students.*
- *Publication of 10 issues of the University of Minnesota MEDICAL BULLETIN and circulation to 6,000 readers each month.*
- *Growth of membership in the Foundation to approximately 2,200 persons, 83% of whom are alumni of the Medical School.*

We trust that the Foundation will continue to merit the confidence and support of its friends in the future.

— EIVIND HOFF, JR., *Executive Director*



Alumni Notes

◆ 1924

Frederick Ebersson writes from 421 Greenbriar Rd., Lexington, Ky., where he has been appointed an associate clinical professor of community medicine at the University of Kentucky Medical School. "In 1962," he writes, "having reached the compulsory retirement age, I was retired from my post of director of health and clinical services at Western Kentucky State College, Bowling Green, Ky. In 1963 I was commissioned a Kentucky Colonel." Dr. Ebersson also earned a Ph.D. in 1918 at Columbia University College of Physicians and Surgeons.

◆ 1925

Karl Lundeberg retired recently after ten years as health commissioner for the city of Minneapolis.

◆ 1930

Carl E. Horn writes from California: "I continue to enjoy reading the MEDICAL BULLETIN but prefer the Alumni 'doings' to the obituaries." Carl has practiced orthopedics in Sacramento, Calif. since 1946 and was recently elected president of the Northern California Chapter, Western Orthopedic Association. He hopes more members of the Class of 1930 will contribute news to the MEDICAL BULLETIN.

Donald A. Dukelow has received the 1964 Distinguished Service Award of the American School Health Association for contributions to school health work. He is assistant director of the Department of Community Health and Health Education, American Medical Association, Chicago, Ill.

◆ 1932

Herbert W. Schmidt was appointed associate medical director of the Minnesota Mining & Manufacturing Co., St. Paul, Minn., where he is associated with Dr. William Hartfiel (Med. '25), medical director. Dr. Schmidt had been an internist at the Mayo Clinic since 1937.

◆ 1933

Robert R. Kierland, head of dermatology at the Mayo Clinic, was appointed to a special medical advisory group of the Veterans Administration composed of 23 specialists in various fields of American medicine.

◆ 1940

O. Erik Hallberg, of the Section of Otolaryngology and Rhinology at the Mayo Clinic, Rochester, Minn., was honored for distinguished service in educational programs sponsored by the American Academy of Ophthalmology and Otolaryngology.

Robert W. Hollenhorst, an ophthalmologist, and **Corrin H. Hodgson**, (Med. '31) an internist, both of the Mayo Clinic, Rochester, Minn., were recently promoted to professor in the Mayo Graduate School of Medicine, University of Minnesota.

◆ 1943

Edgar C. Burseth is in general practice at a three-man clinic in Mora, Minn. His wife, Dorothy, is from St. Paul. Their children are Jon, 18; James, 15; and Judith, 14. Ed served with the Air Force during World War II, and says he enjoys a "busy, rewarding family life, with time out for travel and community activities."

◆ 1953

Daniel J. Hanson has been named Director of the Department of Pathology at Mercy Hospital, Toledo, O., where he has been associated since 1961. Dan is a native of Faribault, Minn. After military service and a year's residency in medicine in Chicago, he practiced in Chaska, Minn., in association with Dr. Carl Heinzerling, a classmate. His residency in pathology, 1957-61, was also at Mercy Hospital.

◆ 1954

Robert G. Carlson's alumni information form arrived too late for inclusion in the Class of 1954 survey which appeared in the November MEDICAL BULLETIN. He reports he's in surgery practice at the Lakeland Clinic, Willmar, Minn., and lives at 1215 Penn Ave. with his wife, Florence, and David, 11; Jim, 9; Diane, 8; and Joel, 6. He served in the Air Force 1956-58, and took a residency at Wayne County General Hospital, Eloise, Mich. Bob plays cello in the "local amateur symphony orchestra."

◆ 1955

Owen W. Holm has joined the Northwestern Clinic, Crookston, Minn., as a general surgeon. He was in general practice for a year in St. Cloud, Minn., before going into the Air Force and later taking a residency at University of Minnesota Hospitals and St. Louis, Mo., City Hospital.

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DANIEL J. HANSON



BRUCE GERSTENKORN



R. W. HOLLENHORST

Dale A. Bergeron is now practicing internal medicine at Le-Sueur, Minn., with the Minnesota Valley Medical Associates.

◆ 1956

Howard H. Wong is now out of the Air Force and has joined the East Range Clinic, Virginia, Minn., as an obstetrician and gynecologist. He took a residency at Mercy Hospital, Toledo, O., before spending four years in the Air Force in Europe.

◆ 1958

Myron I. Doebler is now in practice at the Mora, Minn. Clinic in association with Drs. Harry L. Berge and Edgar C. Burseth, both of the Class of 1943.

Stuart B. Hoffman has begun the private practice of internal medicine in Los Angeles, Calif. His address is 6423 Wilshire Blvd., Suite 209.

◆ 1959

Frank Arko is in general practice at the Mesaba Clinic, Hibbing, Minn., and expects to remain there. He and his wife now have five children; Michelle, 7; Patricia, 6; Tod, 4; Mary Beth, 3; and Carolyn, 6 mos.

◆ 1960

Lloyd A. Whitesell, Jr., is now in general practice at Shakopee, Minn., in association with Dr. Bror F. Pearson (Med. '31).

◆ 1962

Lawrence B. Pearson has completed two years of military service and will begin a residency in neurology at the University of Minnesota on July 1, 1965. He is now working part time as

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a staff physician at the University of Minnesota Students Health Service.

◆ 1963

Capt. John H. Mahler entered the U.S. Air Force in September and is now at the School of Aerospace Medicine, Brooks Air Force Base, Texas.

G. Bruce Gerstenkorn finished his internship at Ancker Hospital, St. Paul, and is now in general practice at the Keith Clinic, Milaca, Minn.

Richard T. Olson is in general practice in Chisholm, Minn., in association with the Messaba Clinic. He was named Intern of the Year during his period of service at Santa Clara County Hospital, San Jose, Calif.

Capt. Michael Sher is now serving in the Army and is stationed at Chinon, France, where he expects to remain for the next two years. He interned at Kings County Hospital, Brooklyn, N.Y. Mail will reach him now c/o 60th Station Hospital, A.P.O. 256, New York, N.Y.

*"This time, like all times, is a very good one
if we but know what to do with it."*

EMERSON

Alumni Deaths

◆ 1913

Dr. Henry W. Woltman, Rochester, Minn. Died November 27, 1964 at the age of 75, of aortic stenosis. He was emeritus chief of the Mayo Clinic's Section of Neurology. Dr. Woltman had retired in 1956. He had interned at University of Minnesota Hospitals and took a residency there 1914 to 1917 in neurology and psychiatry. After service in World War I, he was appointed to the Mayo Clinic staff in 1919. An international authority in his field, he was especially known for his research in polyneuritis and for his work with diverse forms of neuritis.

◆ 1934

Dr. Leo A. Nash, St. Paul, Minn. Died December 1, 1964 of coronary arterial disease at the age of 54. He was born in Chisholm, Minn., and was a practicing radiologist in St. Paul, as well as a member of the clinical faculty at the University of Minnesota Medical School.

Memorial Gifts

The Minnesota Medical Foundation acknowledges with gratitude recent contributions made in memory of:

William Markus
Minneapolis, Minnesota
Mrs. Joseph Solon
Minneapolis, Minnesota
Mrs. Melvin Silver
St. Paul, Minnesota

Memorial gifts are a thoughtful means of honoring the memory of a relative, friend, or colleague. They serve the living by strengthening medical education and research at the University of Minnesota Medical School. Gifts may be designated for specific purposes. The Minnesota Medical Foundation acknowledges all gifts to both donor and next of kin.

THE MEDICAL BULLETIN

NOTICE TO MEDICAL ALUMNI

Send your personal news to the MEDICAL BULLETIN on the form below. Your contribution to "Alumni Notes" will be welcome.

Name _____

Address _____

Class of _____

Multiple horizontal dashed lines for writing.

Detach and mail to: The Editor
University of Minnesota MEDICAL BULLETIN
1342 Mayo Memorial
University of Minnesota
Minneapolis, Minnesota 55455

COMING EVENTS

University of Minnesota Medical School

CONTINUATION COURSES FOR PHYSICIANS

University of Minnesota
Center for Continuation Study

1965

January 4 - 8	Electrocardiography (Introductory)
January 18 - 20	Psychiatry
February 1 - 3	Neurology
February 8 - 12	Proctology
February 15 - 18	Internal Medicine
April 2 - 3	Trauma
April 22 - 24	Obstetrics
May 3 - 5	Ophthalmology
May 20 - 22	Surgery
May 26 - 28	Otolaryngology

The University of Minnesota reserves the right to change this schedule without notification.

Courses are held at the Center for Continuation Study or the Mayo Memorial Auditorium on the campus of the University of Minnesota. Usual tuition fees are \$50 for a two-day course, \$60 for a 2½-day course, \$70 for a three-day course, and \$100 for a one-week course.

Specific announcements are sent out about two months prior to each course to all members of the Minnesota State Medical Association and to any physicians who request information for a specific course. For further information write to:

DIRECTOR
DEPARTMENT OF CONTINUATION MEDICAL EDUCATION
THE MEDICAL CENTER (Box 193)
UNIVERSITY OF MINNESOTA
MINNEAPOLIS, MINNESOTA 55455

"FIND JUST 1 PERSON"

Every doctor of medicine during his lifetime will encounter at least one person who will be anxious and able to do something for humanity. When that time arrives, why don't you suggest that the interested person endow a permanent memorial scholarship in the name of a loved one? Some of the friends of the Minnesota Medical Foundation have given stock, the dividends of which have provided at least a \$500 perpetual scholarship for some worthy student at our Medical School each year. Some donors have named the Minnesota Medical Foundation in their will.

Keep the Foundation in mind and when that right time arrives, you will know when you have found that "just one person" to endow a permanent memorial scholarship.

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