

MEDICAL BULLETIN

UNIVERSITY OF *Minnesota*



in this issue

- EXPERIMENTAL MORPHINE ADDICTION
- SPINAL MYELOMALACIA
- MYOCARDIAL INFARCTION

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HISTORY OF THE MEDICAL SCHOOL

Part VI

During the Medical School's 75th Anniversary Observance, the MEDICAL BULLETIN is publishing brief sketches of some of the great moments and the great men who helped write its history.

CLARENCE MARTIN JACKSON, M.D.

1875 - 1947

Clarence M. Jackson, one of the Medical School's most famous teachers, was born in What Cheer, Iowa, on April 12, 1875, the son of a physician. He received his college and professional education at the University of Missouri, where his work was of such character that he was appointed instructor in anatomy in the year 1899.

Jackson rose to become full professor and head of the Department in 1902, and was made dean of the University of Missouri Medical School seven years later at the age of 34. His notice spread widely, and the University of Minnesota picked him to become head of Anatomy here in the sweeping reorganization of 1913. He took a pay cut and gave up a dealership to take the job at Minnesota.

Of Dr. Jackson a colleague wrote: "He was tall, had a splendid physique, and was handsome in every sense of the word. His hair was jet black and his eyes were so penetrating that one would believe he would promptly detect any wrongdoing — past, present, or future. His voice and manner inspired confidence, and he was the personification of kindness. One could only hope for a lifelong association with him."

Jackson organized the Department of Anatomy so that every staff member was able to do the kind of work he liked best. He kept close contact with every activity; it was uncanny how much he knew about staff members' work in every detail. At examination time he read every student paper in detail and went over them with instructors. He accomplished all of this without creating antagonism — and by working Sundays and holidays. His influence on his students was, of course, prodigious.

Dr. Jackson published more than 100 articles in the scientific literature. He was elected president of the American Association of Anatomists in 1922, a signal honor in the anatomy field, and



won the Distinguished Service Award of the Minnesota State Medical Association in 1941, the first time in history that it had not been awarded to a clinician. Dr. Jackson also served twice as Acting Dean of the University's Graduate School and was president of the Minnesota State Board of Examiners in the Basic Sciences for more than a decade. He was an honored member of Phi Beta Pi medical fraternity, and once lived in the famous old white-columned house on Union Street.

When handicapped in later years by Parkinson's disease, Jackson accepted it philosophically and continued to teach and conduct research until he retired in 1941. He died January 17, 1947, at the age of 71 years.

Jackson Hall, home of the Medical School's departments of Anatomy and Pathology, was named in his honor in 1954.

HENRY L. ULRICH, M.D.

1876 - 1963

Dr. Henry L. Ulrich was born in Newark, New Jersey in 1876, one of a family of six children. He attended Rutgers University, receiving his B.S. degree in 1897. When he failed to win a sociology scholarship at Columbia, he enrolled instead at Johns Hopkins Medical School.

At Hopkins, Dr. Ulrich came under the influence of some of the great men who redesigned medical education at the turn of the century - William H. Welch, William S. Halsted, and Howard A. Kelly. Dr. Ulrich was also house officer under Harvey Cushing and clinical clerk under William Osler, and did special work in pathology. Upon graduation in 1901, in the fourth class to be graduated from Hopkins, he turned down an

offer from the Dallas Medical School (now Baylor), and came to Minneapolis.

Dr. Ulrich first taught clinical microscopy in a basement room of the old University dispensary at Seven Corners. Early in his career he became interested in tuberculosis, and in 1903 was one of the organizers of what is now the Hennepin County Tuberculosis Society.

Few are now aware that Dr. Ulrich devised the commonly used modification of the heat and acetic acid test for albumin in the urine, described in his publication in the *Northwestern Lancet* 29:87,

1909. His bibliography includes a total of 37 articles appearing in local and national journals from 1903 to 1958.

In 1917 Dr. Ulrich was appointed to head the University medical service at Minneapolis General Hospital. The situation at that time could almost be called primitive but in his quiet, indefatigable way, Henry Ulrich brought order out of chaos and the service on the medical wards up to University standards and traditions. In a short time the entire medical service came under Dr. Ulrich's jurisdiction and he also inaugurated a residency program. Dr. Ulrich was always encouraging to the young doctor but was intolerant of sloppy thinking. On occasion he might jolt his listeners into a different appraisal of the problem under discussion as when he delivered the principal address at an annual meeting of otolaryngologists, he chose not to praise their accomplishments but instead to tell them that they had "bartered their heritage for a mess of instruments."

Dr. Ulrich advanced in academic standing and served as clinical professor of medicine from 1927 until his retirement in 1944. He died on June 9, 1963, at the age of 87 years. While continually keeping abreast of advances in medical science, he was always proud to be termed a physician of "the old school."



Special Article

Expanding Vistas of Medical Education*

Victor Johnson, M.D., Ph.D., D.Sc.†

The expression "the practice of medicine" commonly conjures up the picture of the physician alone with the patient he is examining. The picture may be modernized to the extent of replacing the bed in the patient's home as depicted in Sir Luke Fildes' famous painting with a hospital bed or the examining table of the doctor's office or clinic, since today the physician rarely visits the patient's home. Rather the patient goes or is brought to the physician.



The author (right), clarifies a point with interested listeners during the coffee break.

True enough, the confrontation of physician and patient, alone, getting the story of the illness, making the examination, determining the tests needed, deciding what treatment is required, still constitute the nucleus of the practice of medicine. But the bare recounting of these essentials of medical practice constructs an image so simplified as to be false.

The mind's eye might paint a similarly erroneous picture of the preparation for the practice of medicine—medical education. Preliminary labor in the so-called preclinical scientific laboratories of the medical school provides the tools for the manage-

*Address at 12th Annual Medical Sciences Day, "For College Students Interested in Medical Sciences," University of Minnesota, March 5, 1966

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ment of man's diseases. Clinical training in the last two years of medicine and the internship is a supervised apprenticeship for the medical practice to follow. This concept also is correct, in a sense, but it is so woefully inadequate as to be untrue to the total reality.

THE BASIC MEDICAL SCIENCES

The laboratories of anatomy, chemistry, and physiology do indeed provide the basis for an understanding and control of man's ills. But many of you would find these studies dull if this were their entire content.

The laboratories foster an appreciation of scientific truth transcending mere utility. Much of what is learned about human physiology need bear no direct relation to diagnosis or therapy. A knowledge of what Walter Cannon called "The Wisdom of the Body" is an exciting aesthetic experience as well as an intellectual exercise. For example, what may we see in the intricate interplay of organs and systems involved in the control of body temperature? As you pass from the cold outdoors into a warm room or the reverse, a complex of body machinery is set into motion automatically, involuntarily and without conscious effort or even awareness. Involved are sensory nerve endings, nerve fibers and trunks, reflex centers, skeletal muscles, smooth muscles, glands, body hair and blood vessels.

Knowing about these relatively gross human machine parts prompts inquiry into microscopic or submicroscopic machinery: the physics of the nerve impulse involving minute multiple electric circuits and currents at the nerve fiber surface, the chemistry of one nerve fiber transmitting its impulse to another fiber in the spinal cord or brain, the thermal concomitants of the chemical reactions of muscle contraction, the hydrodynamics of blood flow, the nature of secretion by living cells, the evolutionary heritage of hair muscles.

Most of this has no immediate impact upon diagnosis or therapy. But it is of tremendous consequence to the student who is curious about nature and alive to the beauty of its secrets.

The microbiology laboratory is very practical. It tells us what diseases are produced by what microorganisms and how these can be killed by chemicals or rendered harmless by immunization. But microbiology does more than provide the student with useful facts. It unfolds Pasteur's story of anthrax, with its climax as arresting as a Shakespearean play.

The conclusion of this drama was witnessed by "Delegates from the Agricultural Society of Melun, from medical societies, veterinary societies, from the Central Council of Hygiene of

Seine et Marnes, journalists, small farmers . . . all were there." Mostly, they were skeptical or even hostile. They came to see 50 sheep: 25 had been vaccinated, 25 were unvaccinated, and each of the 50 had been inoculated some time earlier with a deadly dose of anthrax. The scene: "The carcasses of 22 unvaccinated sheep were lying side by side; two others were breathing their last . . . All the vaccinated sheep were in perfect health."¹

The preclinical medical school years will develop new habits of thought or will strengthen such habits already partially generated regarding the adequacy of scientific evidence as proof, the necessity for properly devised experiments to demonstrate truth and the need for a healthy skepticism in evaluating claims of a new discovery.

CLINICAL YEARS

It is now common to introduce medical students to some of the problems of patients early in medical school. Predominantly, however, the first two years deal with the laboratory sciences while the last two years are devoted mainly to clinical problems. Classroom instruction all but disappears. Instead, there is now a hospital room, an outpatient department, discussions on hospital rounds, informal seminars. The student has become a member of a team working together to find solutions for the problems of specific individual patients. This learning experience must be so organized that the student renders a real service; he actually does work for the patient and for the team—always under supervision, of course. In fact, unless the student bears a definite share of the labor involved in diagnosis and therapy, his education is lacking essential ingredients.

During the clinical years the complexities of medical practice become clearly apparent. From this experience there emerges the conviction that teamwork and specialization are necessities of medical practice. In so stating, I do not imply that all physicians should seek to become specialists. Many are needed and desire to be family physicians who employ the specialist when he is needed.

SPECIALIZATION

The tremendous increases in medical knowledge in recent decades have made it impossible for anyone to even attempt to master more than a fraction of what is known. The multiplication of specialty fields including family practice and the development of training programs in those areas have opened new exciting opportunities in medicine.

Twenty-five years ago there were about 5,000 physicians in

training beyond the internship. Today there are more than 30,000 such residents, a 600% increase, during a period when the number of graduates from medical schools in this country increased by about 50% (from about 5,000 in 1940 to about 7,400 in 1965). The number of physicians in advanced hospital studies beyond the internship almost equals the total number of medical students in all four years of all U. S. medical schools (more than 32,000).²

I shall not present an account of the vast program of advanced residency training in this country or the elaborate system of identifying and certifying adequately trained specialists for the protection of the public and the profession. I would rather dwell upon some of the ways in which specialization has expanded medicine's vistas and has incorporated into the study and practice of medicine procedures and disciplines and techniques ordinarily considered not long ago to relate to medicine only distantly if at all.

COMPUTERS

The successful adaptations of computers to medical problems are such that it is easy to make almost any conceivable prediction regarding their future role in medicine:

The computer will affect the nature of medical practice of tomorrow as profoundly as did the institution of group practice in the past.

The computer, fed with the facts about a patient, will tell the physician not necessarily what the diagnosis is but rather what diagnostic possibilities should be considered, as well as the statistical probabilities of the various alternatives.

The computer, presented with the findings of a given patient, will in seconds make available to the physician all the pertinent past experience of medicine with the combination of findings in the person in question.

The computer will provide the individual physician with the total of accumulated medical knowledge on any subject, or any significant portion thereof on demand.

These anticipated possibilities contain an element of speculation. That they may not be too far afield is suggested by an example in a limited area—electrocardiography.

Electrical potentials and currents are generated by cells and tissues in action. The nerve impulse is partly electrical in nature. Contracting muscles, including the heart muscle, also generate

electrical changes. In the case of the heart these can be detected, measured and recorded from the surface of the body. The contraction produces a series of electrical changes or waves. Normally each beat involves a succession of five oscillations, alternating upward and downward, each wave of characteristic size and shape. A record of these waves is called an electrocardiogram.

Changes in the electrocardiogram—sometimes very complex—are produced by a number of disorders of the heart, or by diseases elsewhere in the body playing upon the heart. Some of these conditions depend for diagnosis upon the electrocardiogram, with abnormalities in direction and contour and position of the electrical waves.

Enter the computer. The heart specialist provides the machine with his own expert knowledge of the meaning of unusual features of the electrocardiogram so that a specific abnormal tracing “fed into” the computer elicits a response indicating the commonest cause of the abnormality. This the computer produces in a fraction of the time it takes to make the tracing. At the Mayo Graduate School the computer in this project has been so “educated” that its pronouncements today approximate the diagnostic acumen and accuracy of the most skilled heart specialist in our institution.

ATOMIC PHYSICS

You all know that radioactivity in the form of x-rays or radium emanations has been employed in combating cancer, often effecting only limited palliation, but fortunately complete cures sometimes, especially in certain kinds of cancer, such as in the neck of the uterus.

Treatment of cancer with radiation is akin to surgery: the unwanted tissue is removed, in the one instance by killing the offending cells, in the other procedure by physical separation of the tumor from the body. For the most part the surgery of radiation therapy is rather crude. Although it is bloodless surgery, there may be considerable destruction of tissues or organs besides that of the malignant growth.

An interesting example of more precise radioactive “surgery” depends upon a major function of the thyroid gland. Iodine taken by mouth in various compounds enters the bloodstream. From here almost all of it enters the thyroid gland, where the element becomes an essential ingredient of the complex molecule known as the thyroid hormone.

A serious disease of the thyroid gland, hyperthyroidism, involves the production of excessive and damaging amounts of the

thyroid hormone. Until the advent of the atomic age, conventional cutting surgery was the only method of controlling this condition. Surgical removal of most of the gland sought to leave behind just enough of the overactive tissue to supply the body with a proper quantity of the hormone.

Today, radioactive iodine has replaced the surgeon's knife to a considerable extent. When iodine atoms are rendered radioactive they retain most of their former chemical properties. Radioactive iodine, when fed to a patient, is deposited primarily in the thyroid gland, just as is ordinary iodine. Here, in addition to its incorporation into the molecule of the thyroid hormone, it also destroys thyroid gland cells, much as if the gland were exposed to X-rays or radium, except that the destruction is apparently entirely limited to the thyroid gland, in which 80% of iodine eaten localizes. This atomic energy of iodine is similarly employed to destroy thyroid cells which have become transformed into cancer cells.

Atomic investigation has provided medicine with a number of research tools in which a normal element of the diet, rendered artificially radioactive, can be followed through the body because in whatever organ such a substance may lodge, or in whatever excreta it may appear, it betrays its presence, qualitatively and quantitatively by its measurable radiation.

Radioactive iron, for example, soon after ingestion makes its appearance inside the red cells of the blood, where it has been built into the oxygen-carrying compound hemoglobin.

A refinement and extension of the technique for following the pathway of radioactive iron from the digestive tract into the hemoglobin of the red cell and involving the measurement of radioactive iron excretion in the stools reveals the rate at which red blood cells are manufactured in the interior of bones and the normally exactly equal rate at which these cells are destroyed. Such studies disclose that the average life span of a red blood cell is about 125 days. From this observation, calculation reveals the rather startling fact that nearly 2,000,000 red cells of the blood are destroyed — and also formed — per second. Normally this process continues every day, every minute, every second of our lives.

In the five minutes it has taken to explain this phenomenon each of you has lost and remade 600,000,000 red blood cells.

Studies with radioactive elements, studies made possible by application of atomic physics, have revealed many of the closely guarded secrets of life.

ENGINEERING

The chest is a region of the body which has always presented special difficulties to the surgeon. The simple opening of the

abdominal cavity or the skull produces no great change in life processes. The opening of the chest, however, causes a fatal suffocation in a few minutes unless something special is done. The expansion of the chest walls in breathing sucks air through the artificial opening into the chest cavity outside the lungs instead of through the normal air passages into the interior of the lungs where it must find itself in order to provide the blood with oxygen.

This was not the only special problem which delayed successful surgery within the chest until scant decades ago. But it did require a mechanical device, a pump, to force air into the lungs intermittently simulating normal breathing while the surgeon removes a cancer of part of the lung, for example, working safely through a chest opening of considerable dimensions.

The machines for maintaining artificial respiration during such surgery are engineering devices. True, they are relatively simple but they were the precursors of mechanical contrivances of considerably greater intricacy and ingenuity, for which today's spectacular surgery of the heart itself had to wait.

Surgery upon or inside the heart presents no special difficulties not encountered surgically elsewhere, except for an overwhelming prohibition: the blood pumping action of the heart may not be suspended even briefly.

Breaking this impasse was essentially an engineering feat, in which the engineers had to produce machines which possessed a number of the physiological properties of the living beating heart and the surface phenomena of the lungs.

The heart portion of the machine pumps the so-called impure blood into the artificial lung, which is nothing more than a device for spreading the blood in a very thin layer over a large surface area exposed to air. The total surface area of the thin film of blood may be about six square meters (compared with a total area of about 50 square meters of surface contact between capillary blood and air in the tiny air sacs of the human lungs). Over this wide expanse of contact, oxygen moves into the blood purely by physical diffusion, which also accounts for carbon dioxide moving from the blood into the air. Oxygen-laden air is then pumped from the artificial lung into the body arteries to complete the work of the mechanical heart.

These engineering devices by-pass the blood from the heart, which may now be opened for repair of damaged valves or correction of developmental defects. The spontaneous contractions of the heart muscle can also be temporarily discontinued during surgery and reinstated again by machines when the

surgeon has repaired the defect in the heart, has closed the incision in the heart and has re-routed the blood from the machines to the normal channels.

The engineering problems in the heart-lung machine are complicated by the necessity for preventing bacteria from entering the system, by inhibiting the clotting of blood and by returning the blood to the body free from air bubbles.

Quite apart from the practical surgical uses of the heart-lung machine, it has taught us some truths which we have long suspected but have never quite proved: the heart does nothing for the body except pump blood. Its function is entirely mechanical. Again, we now know for sure that the living cells of the tiny air sacs function essentially as inert membranes. The lung tissues do nothing to move oxygen into the blood or carbon dioxide in the reverse direction.

Here we encounter one of the many examples of essential activities in the body which can be explained without calling upon some mysterious unknown property of life or living cells but can be understood in terms of nonliving physics or chemistry. The developments cited make no pretense of completeness. They are only examples. We could examine similar instances in which medicine's vistas have been expanded into other new areas, such as chemistry, chromosome structure, electron microscopy and other science areas, not to mention sociology and economics.

SUMMARY

The study of medicine and the many subsequent channels of medical activity which may be followed offers rich rewards: intellectual, emotional, aesthetic, humanitarian. And, if your major interests seem to lie elsewhere than in biology or medicine, perhaps they are not so far removed.

If you are inclined toward mathematics and statistics with computers as tools, there are ample opportunities for you in medicine. If you wish to pursue studies in atomic physics, medicine offers many applications. If you want to be an engineer there is a place for you in medicine.

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Staff Meeting Report

Experimental Addiction in Monkeys: Chronic Morphine Self-administration*

Travis Thompson, Ph.D.†

In recent years the self-administration of opiates has come to be viewed as a problem for behavioral as well as pharmacological investigation. It has been suggested that the self-administration of a drug is learned and maintained in much the same manner as many other behaviors are learned and maintained. This conception is based on the observation that a large proportion of all behavior is controlled by its consequences. Hence, if some arbitrary response is followed by the presentation of a pellet of food to a food-deprived monkey, that response will be strengthened. Similarly, the same response will be learned if its occurrence is followed by administration of morphine to a morphine-dependent animal.

The investigations reported here used Rhesus monkeys seated in restraining chairs, where they obtained all of their food and avoided electric shocks by pressing levers under specific visual and auditory stimulus conditions. The animals were on a 24-hour a day schedule so that repeated large samples of their behavior could be brought under experimental control. Interspersed with periods of working for food or avoiding shock were occasions when responses led to the infusion of morphine sulphate through a chronically indwelling jugular catheter. The various stimuli associated with food, shock and drug periods, the drug administration, and the data recording were all controlled electronically by devices in an adjacent control room, and it was not necessary to disturb the animals to measure drug effects or to administer the opiate. Because of this degree of experimental control, highly reliable measures of behavioral output were maintained from day to day over a six-month period for each animal.

*From a report to the Staff Meeting of University Hospitals on April 22, 1966
†Assistant Professor, Department of Psychiatry and Neurology

The first experiment demonstrated the feasibility of conditioning monkeys to work for morphine reinforcement. The behavior required to obtain morphine infusion was a complex behavioral sequence. Each 24-hour session was divided into four six-hour cycles. In each cycle each subject had the opportunity to self-administer one-fourth of its total daily morphine intake by completing a complex sequence of responses.

Following stabilization of their complex behavioral sequence, a 24-hour abstinence test was run in which there was no opportunity for drug self-administration. When self-administration conditions were reinstated, the number of responses leading to morphine infusion increased to from three to ten times the baseline value and the latency-to-completion of a fixed number of responses leading to morphine infusion decreased markedly. Subsequently, animals were pretreated with 1.0 mg. of nalorphine (the morphine antagonist) 45 minutes before the self-administration period. A change in performance much like that associated with 24 hours of abstinence occurred. Finally, administration of 7.0, 14.0 and 21.0 mg. of morphine 45 minutes before the self-administration period was associated with progressive disruption of the tendency to work for the drug, although food-reinforced responses were unimpaired.

Subsequent experiments have investigated the effects of increasing the morphine dosage during the development of tolerance on other performances and the effects of morphine withdrawal on other behaviors necessary for maintenance of the animal. In one experiment monkeys were conditioned to emit a fixed number of responses that would lead to food and morphine infusion. During each morphine self-administration period, the total dosage administered was regulated by the monkey. As drug tolerance developed, it was expected that the animal would administer increasingly large doses of morphine. The primary measure of tolerance development was the number of self-infusions per opportunity. The monkey also worked for food during periods immediately before and after morphine infusion. In this way, it was possible to determine whether administration of the drug had any progressively detrimental effect on food-reinforced performance.

After 30 to 45 days, a "maintenance" dosage was reached, after which total daily intake stabilized, and the pre- and post-morphine food performances were compared over the course of tolerance development. As tolerance to a given dosage developed, the pre-self-administration level of food-reinforced performance deteriorated, although this performance improved

during the immediate post-drug period. However, if the dosage per infusion was abruptly increased, a reverse effect was obtained. This suggests that as long as the dosage is appropriate to the degree of tolerance developed, other behaviors will not be impaired.

The effects of morphine abstinence on food-reinforced and shock-avoidance behaviors were also studied. This was done by not providing subjects with an opportunity to work for the drug. During abstinence there was a progressive reduction in the tendency to work for food, and the shock-avoidance latencies decreased toward the preabstinence base line. A placebo effect was obtained when saline was substituted for morphine after such an abstinence period. A temporary return of food-reinforced behavior occurred immediately after the first placebo self-administration, but this was followed by progressive disruption of food-reinforced behavior.

Finally, red stimulus light was presented to several animals during morphine infusion. These subjects were put through a withdrawal procedure during which they emitted the complex behavioral chain as usual, but saline was infused instead of morphine and the red light presented as before. It was found that these animals still actively pressed the lever for saline infusion and the red-light presentation for 60 days after the beginning of withdrawal. Thus, the stimuli associated with morphine infusion exercised great control over maintenance of morphine self-administration.

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

EMERSON

Staff Meeting Report

Medical Care from Tax Sources*

Annie Laurie Baker†

Medical history will mark 1966 as the year the federal government first entered into the tax-supported payment of medical care for broad segments of its citizenry. The 88th Congress passed two acts—*Medical Assistance* and *Medicare*—which provide benefits to specific groups: (1) those now receiving or eligible for Public Assistance, (2) children of low income families, and (3) people over 65 years of age.

A brief historical review of medical care paid from tax sources may be helpful in placing the present programs in proper perspective. In this context medical care means physicians' fees, hospital charges and essential services.

The United States was founded on the belief that government exists for the benefit of people. However, a concern for the welfare of people was late in coming. In 1852 Pres. Franklin Pierce vetoed an act to set aside land for the benefit of the insane on the grounds that the Constitution placed charitable activity with the states. From 1854 until 1930, a period of 76 years, the federal government made no significant appropriations for welfare purposes. When Pres. Franklin Roosevelt took office there were millions of Americans hungry and desperate. Many emergency laws were passed during the early part of his administration, culminating in the Social Security Act of 1935. This act provided Old Age Assistance, Aid to Dependent Children, Aid to the Blind and later, Aid to the Disabled. Title V of the Act made funds available to provide direct medical services for crippled children. The next important medical care legislation came with the Kerr Mills Act in 1963 which paved the way for the present medical care laws. Beginning in 1966, the federal government will participate in financing medical services for most people over 65 years of age, children of low income families (birth to 21 years of age), to mothers with dependent children, the blind, and the disabled.

*From a report to the Staff Meeting of University Hospitals on April 1, 1966

†Professor and Director, Social Service Department, University Hospitals

The Minnesota Legislature has had a liberal tradition toward people, as shown in its provisions made for the sick. The people of the state were first concerned with the problems of the insane. The St. Peter State Hospital was opened in 1865 and for the next 34 years was the center of attention. Before the turn of the century other state mental hospitals were established—Rochester, 1877; Fergus Falls, 1890; Hastings and Anoka in 1899. In 1907 the State Sanatorium for the Tubercular was opened at Walker, Minn. In 1911, the University Hospitals was built to serve the indigent of the state. In 1917 the Gillette Hospital for Crippled Children was established. The Poor Law passed in 1920 made the responsibility of emergency medical care the financial obligation of the locality in which the need arose. The Crippled Children's Services Program came with the Social Security Act of 1935 and provided direct medical services to children, augmenting the Gillette Hospital program. The state legislature appropriated funds to assist county welfare departments in providing medical care for people on Old Age Assistance Programs in 1955. The law made it possible for people whose resources were sufficient for living expenses to receive public funds for medical expenses. The same plan was extended to mothers with dependent children in 1957, and to the disabled in 1965. Medical care for children has been financed through county and state authorization at the University Hospitals or through local funds in private institutions.

Generally speaking, with few exceptions, the Minnesota groups covered by the new medical programs would have received medical care paid from tax sources even if the legislation had not been passed. Minnesotans will benefit hereafter from a shift of the tax burden. The Medical Assistance law makes a contribution of 60% of the costs of medical care of the people who receive the services. The remaining 40% is shared equally by the State and County governments. The cost of medical care provided under Medicare will be paid out of the Social Security funds with no state or county contribution.

The Social Service Department for 53 years has been involved in helping patients and families plan for their post-hospitalization adjustment. The new federal legislation should provide funds and allow more time to do the important job of helping patients solve the social problems related to illness.

The purpose of the new medical legislation is to provide complete and high quality medical care for the affected groups and to coordinate the health resources of the community so as to assure a wide range of services. One of the interesting parts

of the new law is the manner in which medical services are to be rendered. The control and direction of medical care for those affected is placed with doctors. The patient will have free choice to select his physician. All he needs is a little plastic card. It will give him the prestige and advantages of a private patient. And he is free to change his doctor if not satisfied.

The physician is also granted a good degree of freedom, to treat the patient as his best medical judgment dictates and to expect the patient will remain under his care as any other who comes to his office. A continuity of medical care should be assured.

There are many unsolved needs of the indigent people of this nation. Some Americans are still hungry and in need of clothing and adequate housing. There should be concern lest all the money be drained off into medical care without sufficient regard for the other necessities of life. This calls for wise planning since medical care can be effective only when accompanied by proper nutrition, sufficient clothing, and adequate housing. The next decade promises to be exceedingly challenging and demands intelligent leadership from the health professions so that Americans will benefit fully from the programs which Congress has provided.

Naming the Minnesota Medical Foundation as beneficiary of a life insurance policy is consistent with current concepts of alumni support for Alma Mater. When a new policy stipulates the Minnesota Medical Foundation — or other educational, charitable, or religious institution — as the irrevocable beneficiary, the owner may write off the premiums as an annual tax deduction. There is also a variation of this plan. If you donate a certain portion — say 10% — of your existing life insurance, you then earn a current tax deduction of 10% of the present cash value of the policy, plus an annual deduction of 10% of the premium. The Minnesota Medical Foundation welcomes gifts of life insurance from alumni or other friends of the University of Minnesota Medical School.

Staff Meeting Report

Alterations in Cardiovascular Control in High Spinal Myelomalacia*

Theodore M. Cole, M.D.,† Frederic J. Kottke, M.D., Ph.D.,‡
and Mildred E. Olson, B.S.§

Loss of cardiovascular regulation occurs in quadriplegic patients under two conditions. When the patient is placed in the upright position, blood pressure falls; when the sympathetic nervous system is stimulated, blood pressure rises. Hypertension occurring when the sympathetic nervous system is stimulated is called autonomic hyperreflexia and was first described in 1917. The syndrome may also include headache, sweating, pylomotor activity, flushing, dilated pupils, nasal stuffiness, blurred vision and bradycardia. Hypertension is the most dangerous symptom and has been known to cause generalized seizures and even death. The syndrome is usually seen following distention of a viscus below the level of a spinal cord injury but may be seen after a variety of stimuli.

Afferent impulses entering the spinal cord may initiate segmental reflexes, and also ascend in the posterior column and the spinothalamic tract to synapse with neurons in the intermediolateral columns of the thoracic cord initiating sympathetic vasoconstrictor reflexes. In the normal individual, medullary vasomotor centers may inhibit the autonomic and segmental reflexes. In the quadriplegic patient, inhibitory impulses are blocked by the spinal cord lesion leaving the sympathetic reflexes uncontrolled. Baroreceptors in the carotid sinus and aorta send afferents to the vasomotor centers which in turn send efferents traveling in the vagus nerve to slow the heart.

In order to determine the frequency and magnitude of these cardiovascular abnormalities, eight quadriplegic patients and three normal volunteers were studied. The patients were young men who had suffered traumatic injuries of the cervical spinal cord and the control subjects were three healthy young males.

*From a report to the Staff Meeting of University Hospitals on April 29, 1966

†Assistant Professor, Department of Physical Medicine and Rehabilitation

‡Professor and Head, Department of Physical Medicine and Rehabilitation

§Associate Scientist, Department of Physical Medicine and Rehabilitation

Thirty-four stimulus situations occurring commonly during care of a quadriplegic patient were applied wherever possible to all subjects. Mean arterial blood pressure was monitored from the brachial artery through a small nylon catheter and the pulse rate was measured by an electrocardiographic chest lead.

Most of the stimuli were innocuous, including positional changes in bed, physical therapy modalities, emotional stress and many of the nursing procedures. Four groups of stimuli were found to alter pulse and blood pressure. These included postural changes, feeding, strenuous exercise, and recto-genital manipulation.

All stimuli producing hypotension in the quadriplegic patients had an opposite effect upon the blood pressure of the normal subjects. A postural change from the recumbent to the upright position produced orthostatic hypotension in the quadriplegic patient because vasomotor control was lost. Mean blood pressure dropped 34 mm. Hg. and pulse rate increased 25 beats per minute. Normal subjects, however, either maintained or slightly increased blood pressure and pulse rate.

Eating and drinking caused a slight increase in pulse rate and blood pressure in the normal subjects, whereas in quadriplegic patients they caused a mild drop of blood pressure and a reciprocal elevation of the pulse rate. The reason for this difference is not clear but may be due to reflex vasodilatation of the splanchnic bed of the quadriplegic.

In the normal subjects, strenuous exercise produced an increase in heart rate and blood pressure. In the quadriplegics, blood pressure did not rise under physical stress, although heart rate increased.

The hypertensive response of autonomic hyperreflexia was most clearly shown during recto-genital stimulation of the quadriplegic patient. Digital rectal stimulation produced an average increase in mean blood pressure of 22 mm. Hg. while the pulse rate showed a reciprocal slowing. Normal subjects, however, showed no clear cut response to the stimulus. Bladder distention in the normal subject caused a mild rise of blood pressure without a reciprocal bradycardia. Bladder distention in the quadriplegic produced an increase of blood pressure three times greater than that of the normal and a fall in pulse rate of 30 beats per minute. These findings are of some clinical significance since abrupt hypertensive crises in quadriplegic patients may be precipitated by an unsuspected occlusion of the urethral catheter or impacted stool in the rectum. Equally important, however, is the demonstration that most of the quadriplegic patients' daily activities are well tolerated.

Staff Meeting Report

Myocardial Infarction: Two Cooperative Clinical Studies of Therapy*

Jacob E. Bearman, Ph.D.,† George H. Berryman, M.D.‡
Byron W. Brown, Jr., Ph.D.,§ and
Yick-Kwong Chan, Ph.D.¶

A previous study showed no reason for physicians' preferring heparin to warfarin in the treatment of acute myocardial infarction. A follow-up study of survivors of the cooperative study, "Sodium Heparin vs. Sodium Warfarin in Acute Myocardial Infarction" (J.A.M.A., 189:555, 1964) was undertaken at four months and at one year following the patients' infarct. Each of 795 patients with a new myocardial infarct had been randomly assigned to treatment with one of the anticoagulants when admitted to one of the 13 cooperating U. S. hospitals; each patient had remained on the assigned regimen during hospitalization, usually lasting 21 to 28 days. Following discharge, patients were returned to the supervision of their personal physicians and placed on long term anticoagulation at the physicians' discretion.

Of those hospitalized¹ in the cooperative study, about 19% died during the hospitalization period. The highest death rates were observed during the first four days of hospitalization when the mean death rate per day was about 2.4%. Days 5-7 showed

1. Two recent reports (Dawber, T. R., et. al., "Framingham Study", cited in *Modern Concepts of Cardiovascular Disease*, 30:671, 1961; and Weinblatt, Eve, et. al., "Return to Work and Work Status Following First Myocardial Infarction", presented at 93rd Annual Meeting of the American Public Health Assoc., Oct. 1965) indicate that about 1/6 to 1/5 of patients with newly occurring myocardial infarctions die suddenly, i. e., do not survive long enough to be hospitalized.

*From a report to the Staff Meeting of University Hospitals on April 15, 1966

†Professor of Biostatistics, School of Public Health, University of Minnesota

‡Clinical Associate Professor of Medicine, University of Illinois; Medical Director, New Products Division, Abbott Laboratories, North Chicago, Illinois

§Professor of Biostatistics, School of Public Health, University of Minnesota

¶Former Research Fellow in Biostatistics, School of Public Health; now at Department of Epidemiology and Public Health, School of Medicine, Yale University

a mean death rate per day of about 1.2%, and days 8-28 about 0.3%.

Two of the early post-hospitalization periods are of special interest. (1) Up to three months, return to work is not advised; during days 29-90, the follow-up showed a mean death rate of 0.07% per day. (2) Between weeks 12-16 return to work may be permitted, barring obvious contraindications; follow-up showed a mean death rate per day of 0.05% during days 91-120.

During the remainder of the year following the infarction, about 6% of the survivors died. This corresponds to a mean death rate per day of approximately 0.03%. During *all* periods, a relatively higher mortality was found in patients with a history of previous myocardial infarction. Patients reported by their physicians to have continued on anticoagulants throughout the year (predominantly oral anticoagulants) did *not* show a more favorable mortality rate over patients with equally severe infarcts who were not continued on anticoagulants.

During the previous study the question arose concerning arrhythmias as the most important factor in sudden deaths during the first few days. This revived an old controversy, viz., whether prophylactic use of anti-arrhythmic agents might be effective under carefully controlled conditions. Thus, a new cooperative study in five U. S. hospitals was planned to provide a side-by-side comparison of the preventive use of anti-arrhythmic drugs versus none in acute myocardial infarction. The general plans for this study were similar to those of the anticoagulant study. The outstanding feature was again strict random assignment of patients with myocardial infarction, but in this study to three regimens: (A) Quinidine and (B) Procainamide, each in specific dosage schedules; and (C) neither drug. Since one of the purposes of the study was to ascertain whether benefit was obtained from the prophylactic use of each anti-arrhythmic drug, no patient was included if he was admitted with an acute complication already present. Once admitted, each patient was randomly assigned to regimen, as above; all other aspects of treatment or hospital care were left to the discretion of the attending physician. As with the anticoagulant study, careful and complete records were specified and routinely collected on all patients, including follow-up records.

The results of the study in the acute phase of the myocardial infarction are presented. There was no evidence of benefit from prophylaxis since (1) 21-day death rates are not materially different among the three regimens; and (2) the occurrence of arrhythmias was discovered only slightly more often in the group of patients *not* given anti-arrhythmic drugs. Moreover, about as

many patients receiving each anti-arrhythmic drug required change of treatment owing to drug intolerance as developed arrhythmias.

An incidental finding was made on the comparative incidence of death in patients who were not included in the study because arrhythmias were present upon their admission. Such patients had approximately twice the mortality rate that was found in any of the three groups in the study (no arrhythmias present at time of admission).

The question of possible benefit from prophylaxis is considered not yet fully answered for two reasons: (1) the single standardized drug dosage was found not to be satisfactory for producing adequate blood levels; and (2) detectable arrhythmias could not have included those which may have occurred *between* scheduled examinations of the patient. Thus, an extension of this cooperative study is now under way. It includes (1) graded dosage levels of the anti-arrhythmic agents scaled to the weight of the patient and to blood levels of the drug as determined by laboratory analysis; and (2) continuous electronic monitoring of patients to provide a complete record of the types and frequency of arrhythmia that occur during the first 96 hours of hospitalization.

Acknowledgement is gratefully made to the clinical participants and the staffs of their institutions who were responsible for patient care in the arrhythmia study: P. C. Gazes, M.D., Medical College Hospital of South Carolina, Charleston; J. R. Kitchell, M.D., Abbingdon Memorial Hospital, Abbingdon, Pa.; L. E. Meltzer, M.D., Presbyterian Hospital, Philadelphia, Pa.; Oscar Roth, M.D., Hospital of St. Raphael, New Haven, Conn.; W. H. Rosenblatt, M.D., University of Mississippi Hospital, Jackson. Acknowledgement to the clinicians in the anti-coagulant study is in the reference cited.

Medical School News

A two-story addition to the Masonic Memorial Hospital at the Medical Center is nearing completion, thanks to a recent gift of \$1.1 million from the Masons of Minnesota. The expansion will double the size of the hospital, adding space for 40 beds and 10,000 sq. ft. of new cancer research laboratories. The hospital is devoted principally to care of patients with cancer and other long term illnesses, and was opened originally in October, 1958.

The Masons presented a solid gold check for \$1.1 million to University officials in victory ceremonies held April 19.

Among 21 University of Minnesota faculty members who will retire in June are **Dr. Gerald T. Evans**, professor and head of the Department of Laboratory Medicine, with 28 years of service; and **Dr. Ernst Simonson**, professor in the School of Public Health, with 22 years of service.

Dr. Henry E. Michelson, emeritus professor and former director of the Medical School's Division of Dermatology, has been elected an Honorary Member of the Section of Dermatology, Royal Society of Medicine, London, England.



FACULTY CONFERENCE—Professors J. Arthur Myers (Public Health), C. Walton Lillehei (Surgery), and Lemen J. Wells (Anatomy) argued a point at the recent social hour and banquet sponsored by E. R. Squibb. Visible behind Dr. Lillehei is Dr. Louis Tobian, Department of Medicine.

Dr. Wesley W. Spink, professor of medicine, presented the first *Ellard M. Yow Memorial Lecture* before the Houston, Texas Society of Internal Medicine on March 24. He spoke on "*Lessons in Biology Learned from Brucellosis.*" Dr. Spink also addressed the faculty and students of Baylor University School of Medicine on "*Pathogenesis of Endotoxin in Shock.*"

Dr. John J. Hochfilzer, member of the clinical faculty in otolaryngology at the Medical School and practicing St. Paul physician, died March 12, 1966 while on a skiing holiday in Colorado. He was 75 years old and a native of Austria.

Dr. William Schofield, professor of clinical psychology, delivered the *Henry W. Coe Foundation Lecture* on April 8 at Morningside Hospital, Portland, Ore. His topic was "*Family Conflicts in Education.*"

Alumni Notes

Five Medical School graduates looked over a new map of the University of Minnesota campus recently during a luncheon held at Mound Park Hospital, St. Petersburg, Fla. L-R are Karl W. Anderson (Med. '24), vice president of the Minnesota Medical Foundation; Frank Bachnik (Med. '36); Arnold S. Anderson (Med. '24); John M. Rumball (Med. '34); and Eugene W. Hanson (Med. '56).



◆ 1961

Five years after graduation, members of the Class of 1961 are busy with a variety of medical activities. Here are some recent reports:

David W. Anderson will complete a three year residency in Dermatology at University Hospitals this summer and will join Harold G. Ravits (Med. '41), St. Paul, in practice. Dave lives

at 731 Parkway Dr., St. Paul, with his wife, Corrienne, and three year old son.

David B. Auran practices psychiatry alone in St. Paul, and consults with some of the agencies in the area, as well as serving on the Medical School's clinical faculty. He and his wife, Shirley, and five sons live at 1635 Bayard Ave., St. Paul.

Bruce J. Bart is a dermatologist with the Fargo, N.D. Clinic. He finished his residency at Minnesota in July, 1965, and practices in association with Warren L. Macauley (Med. '42).

Robert H. Berland was to enter the Army May 2, 1966, and expected to be a neurologist at Ft. Polk, La. He has had residency training in Internal Medical and Neurology in the East, and now has a family consisting of his wife, Harriet, and two daughters.

Richard Carley is entering the Navy this summer upon completion of his ENT residency at University Hospitals, and will be stationed at Oakland Naval Hospital in California. Later, he expects to practice in St. Paul.

Bill Conrad is over halfway through an eye residency in the Army at Walter Reed Hospital, Washington, D.C., and says he's "completely sold on the specialty as combining medical and surgical practice in all age groups." The Conrads were expecting an addition in July. They already have a son, Peter, 2½, and are living at 1612 N. Springwood Dr., Silver Spring, Md.

Don Creevy is instructor and chief resident in OB-GYN at Stanford University School of Medicine, and writes that he will enter private practice in Palo Alto on July 1.

Alan D. Espelien is a full time anesthesiologist at St. Paul-Ramsey Hospital.

David Folkestad completed his Air Force service a year ago, and is now in a pediatric residency at Maricopa County Hospital, Phoenix, Ariz.

John Gaertner is in general practice in North St. Paul, Minn. Jack is married, and has four children, including twin girls born last January.

Capt. Adrian Kapsner is stationed at Ft. Detrick, Md., having entered the Army last February for two years of duty, which interrupted his radiology residency at Minneapolis V.A. Hospital. Prior to that he was in general practice in Hutchinson, Minn. He and his wife have three sons.

Bill Knipp is a GP with a five man group at the Lake Region Clinic, Brainerd, Minn. Two of his associates are James Bender (Med. '35), and Earl Kanne (Med. '45).

David W. McQuoid is a GP at Littlefork, Minn., with Joel Brende (Med. '62), and formerly had Dick Rowe (Med. '60) as a partner (now practicing in Silver Bay, Minn.) David enjoys the 800-pop. community, and "gets a great deal of satisfaction in treating the 'whole man' as well as the entire family." The McQuoids have three children.

Capt. Gerald Mindrum is an Army medical officer at Ft. McNair, Washington, D.C., and has completed a two year GP residency while in service. He hopes to return to Minnesota when his military service is completed late in 1967.

James E. Monfore is in general practice at Winner, S.D. He writes, "unfortunately, I've not been able to return to the 'U' since graduation. No doubt I'd be as lost and awed as when I stepped out of the South Dakota cornfields and joined the junior class there 7 years ago. Come out pheasant hunting sometime!"

Charles Murray is with the Air Force at Scott AFB, Ill., 30 mi. east of St. Louis. He and his wife have three children. "Since graduation, I completed a residency in internal medicine at Stanford, including a year in endocrinology," he writes, "and have been in the Air Force almost a year now."

Evan L. "Bud" Nelson, Jr. is completing an ENT residency at the Mayo Graduate School of Medicine, and will join the Nicollet Clinic in Minneapolis this summer. Bud says he's "taking the bull by the horns" and building a home in Edina for his wife and five children.

Leo K. Nelson was in general practice at the St. Croix Falls, Wis. Clinic, but expected to enter the Army this Spring.

John Pelley entered the Air Force on April 1, and is now stationed at Malmstrom AFB, Great Falls, Mont. He has recently been practicing in Gig Harbor, Wash.

Raymond M. Peterson is taking a pediatric residency at Children's Hospital, Los Angeles, Calif., and lives at 4590 Sunset Blvd., with his wife, Marcia, and their 3-year-old son, Bradley, who was born in Germany while Mac was stationed with Army at Hanau.

Edward L. Peterka was appointed an assistant professor of dermatology at the University of Colorado School of Medicine, Denver, Colo., on January 1, 1966.

Thorild A. Ross is reported to be "in the Navy" for two years.

Patrick J. Scanlon is an anesthesiologist in Minneapolis. Pat hopes many of the Class of '61 will attend the 1966 Medical

Alumni Homecoming Reunion Oct. 14-15 at the Sheraton-Ritz Hotel, Minneapolis.

Stan Simons, Jr. is now in ophthalmology practice in Kennewick, Washington, after finishing a residency at the Mayo Graduate School of Medicine. "My wife and 3 children and I are looking forward to finally living outside of Minnesota's sphere of climate after 8 years of complaining about it, but eventually learning to make the best of it," he comments.

Roger Strand is a second resident in general surgery at Hennepin County General Hospital, Minneapolis, and is working on kidney and liver transplant problems.

Scott Nicholas is nearing completion of a two year fellowship in allergy and immunology at the University of Michigan. This summer he will join William Eisenstadt (Med. '38) in practice in Minneapolis. Scott's family now includes three children.

Stan Thompson is at the University of Iowa Hospitals, Eye Dept., and is headed for a one-year N.I.H. fellowship at the University of California. After that, he expects to return to the medical faculty at Iowa.

Neva M. Wieseke is associated with the *Instituto Linguistico dt Verano*, Casilla 2492, Lima, Peru.

David Worthen writes from Newton, Mass., where he is an ophthalmology resident at Massachusetts Eye & Ear Infirmary (Boston). He and his wife, Gaye, have three children.

Robert L. Zemke is in general practice in association with his father, E. E. Zemke (Med. '29) in Fairmont, Minn.



Joe Westermeyer and his wife, Rachel, are in Southeast

Asia with the U.S. Aid to International Development program. Mail will reach them via USAID, American Embassy, APO, San Francisco, Calif. 96352. Joe writes from Vientiane, Laos:

"Rachel and I appreciate your taking time to write us. Our twice-weekly mail deliveries are a big event. News from home — even about the weather — has assumed an important role in our lives.

"It's difficult to describe the situation over here briefly. Mostly my work is in bamboo village dispensaries and along trails in the mountainous areas adjacent to Burma, China, North Vietnam, and the Ho Chi Minh Trail. As a result, I am away from home much of the time. Since roads are few, "rounds" are by slow-take-off-and-land aircraft and helicopter. Hiking shoes and pancho replace suit and tie, and my gear is in a backpack instead of a black bag. Refugees, village epidemics, and casualties of war form the bulk of my 'practice' here.

"Enclosed is a Polaroid that we took today (see photo). On the left is the Mekong River. On the right is the 'River Boulevard' of Vientiane . . . I'm holding Michelle . . . Rachel is holding a ten day old Meo baby boy that I brought home from up north. (The Meo are a tribal group that live in the northern mountains.) The child was born with an imperforate anus and arrived at our only infirmary-hospital three days old, dehydrated and with pneumonia. After a colostomy, fluids, and antibiotics, he perked up in a few days. Rachel will be taking care of him for a few months till he is well . . . (We are expecting our own family addition shortly).

"Though Rachel is anxious to get back to her roses and I've had a few close shaves with falciparum malaria and 60 mm. mortars, we've decided to stay another year. There's too much to do here and too few to do it. The people are rewarding to work and live with, and we feel a certain commitment to them and their future. Say hello for us . . . We'll see you next year."

Book Review

Ferment in Medicine

Dr. Richard M. Magraw

W. B. Saunders Co., Philadelphia, Pa., 1966, pp. 272, \$6.50

FERMENT IN MEDICINE, by Dr. Richard M. Magraw is an expression of concern by a dedicated physician for the future of his chosen field. Through it runs the constant concern for the personal worth and needs of the patient.

Dr. Magraw begins his book with a discussion of basic concepts, the idea that we tend to forget that disease is really "dis-ease" and in forgetting this, we say in effect, "I take care of diseases, not people". From here he proceeds to an examination of the patient's complaint, i.e., "What is really bothering the patient" and then an analysis of the medical contract that must be established between the patient and the physician. The central issues in this contract are, he says, "The patient's awareness of a need for help and the issue of whether the physician's professional function extends beyond what are ordinarily considered to be technical skills".

Dr. Magraw spends several chapters examining carefully the role of the patient and the role of the physician. He stresses the importance of recognizing the true needs of the patient and states "The physician who often talks and thinks in terms of interesting or good or bad cases has not fully assumed the physician role. He has not put aside his own needs (in order) to care for the patient". In additional chapters he carefully documents the impact of hospital medicine, the research establishment, specialization, insurance and automation on medical care as we have known it. He also reviews the growing influence of the government on medical practice.

Ferment in Medicine will be of prime interest to the physician who believes his responsibility is to treat the patient including his disease but will not hit as responsive a note in the physician who believes and finds humor in the saying, "Medicine would be a lot of fun if it weren't for people". For the former is also concerned about the changes occurring in the practice of medicine and he wants to know what can be done to adjust to these changes while still retaining the concept of on-going personal care. Conversely, the book will be of less interest to the physician in research or in other isolated fields whose work will not be influenced by any conceivable change

in medical practice. The book should also be of real interest to non-physicians who wonder what happened to the "good old family doctor" and who wonder what is in store for them and their children in the way of medical care in the years to come. Dr. Magraw masterfully spells out the basic elements of personal medical care and the forces in society that inevitably will modify the rendering of this care. To physicians he issues the challenge, "Social history contains many stories of debacles resulting from blind or obstinate resistance to change, but it is also replete with examples of triumphant adaptation and mutation. On an individual basis we all admire persons who, having come from one culture as an immigrant for example, make a successful adaptation to a new environment and we are likely to condemn the person who cannot or does not adapt. Doctors individually and collectively face this kind of challenge and choice".

Ferment in Medicine is clearly and concisely written and is well worth reading.

H. P. VAN CLEVE, M.D. (Med. '43)
Austin, Minnesota

Alumni Deaths

◆ 1908

Dr. Edward L. Fortier, Brookings, Ore. Died March 8, 1966, following a long illness. He was 81 years old. Dr. Fortier was a general practitioner in Little Falls, Minn. for many years prior to his retirement.

◆ 1921

Dr. Merrill A. Howard, St. Paul, Minn. Died March 1, 1966 at the age of 69 years. He had practiced in St. Paul until his retirement eight years ago.

◆ 1923

Dr. James C. Colignon, Canoga Park, Calif. Died February 16, 1966, aged 65, of the effects of a series of cerebrovascular accidents. He had retired in 1961 after serving a chief physician with the V.A. medical service in Los Angeles. Dr. Colignon practiced many years previously in Green Bay, Wis., heading the medical staffs of St. Mary Hospital and Brown County Sanatorium there.

◆ 1927

Dr. Cassius J. Van Slyke, Bethesda, Md. Died April 22, 1966. He was retired deputy director of the U.S.P.H.S., and holder of

the University of Minnesota's Outstanding Achievement Award (1957). A native of Benson, Minn., he retired from the Service in 1959. He was 65 years old.

◆ 1932

Dr. Herbert W. Schmidt, St. Paul, Minn. Died April 7, 1966 of a brain tumor. He was 62 years old and had been medical director of the 3M Co. since May, 1965. Dr. Schmidt spent nearly three decades at the Mayo Clinic after graduation from the Medical School. He was a professor of medicine, former member of the Clinic's Board of Governors, former president of its staff, and a regent of St. Olaf College. Dr. Schmidt had been ill since last fall.

◆ 1936

Dr. Burt J. Canfield, Rockford, Ill. Died April 10, 1966, aged 56 years. He was co-founder of the Canfield Clinic at Rockford, and formerly resided in Minneapolis. A twin brother, Dr. Bruce Canfield (Med. '33), practices in Rockford. Among survivors are two sons, Capt. Thomas Canfield (Med. '64), and Robert Canfield.

MEMORIALS

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

Abraham Beirstein Minneapolis, Minn.	Otte Boersma Minneapolis, Minn.
Mrs. Leona M. Carlson St. Louis Park, Minn.	Dewey D. Connors Minneapolis, Minn.
Mrs. Lyda Cunningham Excelsior, Minn.	Mrs. Grace Dayton Minneapolis, Minn.
R. Verne Olson Minneapolis, Minn.	J. H. Robertson Willmar, Minn.
Rolland Stussi Minneapolis, Minn.	

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.

COMING EVENTS

University of Minnesota Medical School

CONTINUATION COURSES FOR PHYSICIANS

University of Minnesota
Nolte Center for Continuation Study

1966

May 2 - 3	Ophthalmology
May 19 - 21	Surgery
June 1 - 3	Anesthesiology
June 16 - 18	Hypnosis in Medicine
September 20 - 22	Pediatrics
September 29 - October 1	Nuclear Medicine
October 6 - 8	Obstetrics
October 10 - 15	Vectorcardiography
October 20 - 22	Dermatology
October 31 - November 4	Radiology (Angiography)

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

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