MEDICAL BULLETIN

UNIVERSITY OF *Minnesota*

in this issue

VOLUME XXXIX, NUMBER 2 OCTOBER 1967

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UNIVERSITY OF MINNESOTA

Medical Bulletin

Official Publication of
UNIVERSITY OF MINNESOTA HOSPITALS
MINNESOTA MEDICAL FOUNDATION
MINNESOTA MEDICAL ALUMNI ASSOCIATION

Circulation this issue: 6,500 *32 Pages*

VOLUME XXXIX *October 1967* NUMBER 2

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Published monthly from September through June at Minneapolis, Minn. No advertising accepted. Second class postage paid at Minneapolis, Minn. Address all communications to The Editor, University of Minnesota Medical Bulletin, 1342 Mayo Bldg., University of Minnesota, Minneapolis, Minn. 55455.

Special Article

North by North

Arthur C. Aufderheide, M.D. ('46)

Late last winter 16 hardy Americans and Canadians, led by insurance executive Ralph Plaisted of St. Paul, Minn., undertook a chilling adventure: an unprecedented journey across the Arctic ice pack to the North Pole using gasoline powered snow sleds called snowmobiles.

The 770-mile trip was conceived as a scientific experiment in the rugged Minnesota tradition. It would be timed for completion during minimal periods of Arctic storms, and would be completed before the Spring sun thawed dangerous holes in the Polar ice pack. The return trip would be by air evacuation. Finally, the trip would help prove or disprove whether the North Pole could be reached overland, as history books report Adm. Peary accomplished in 1909.

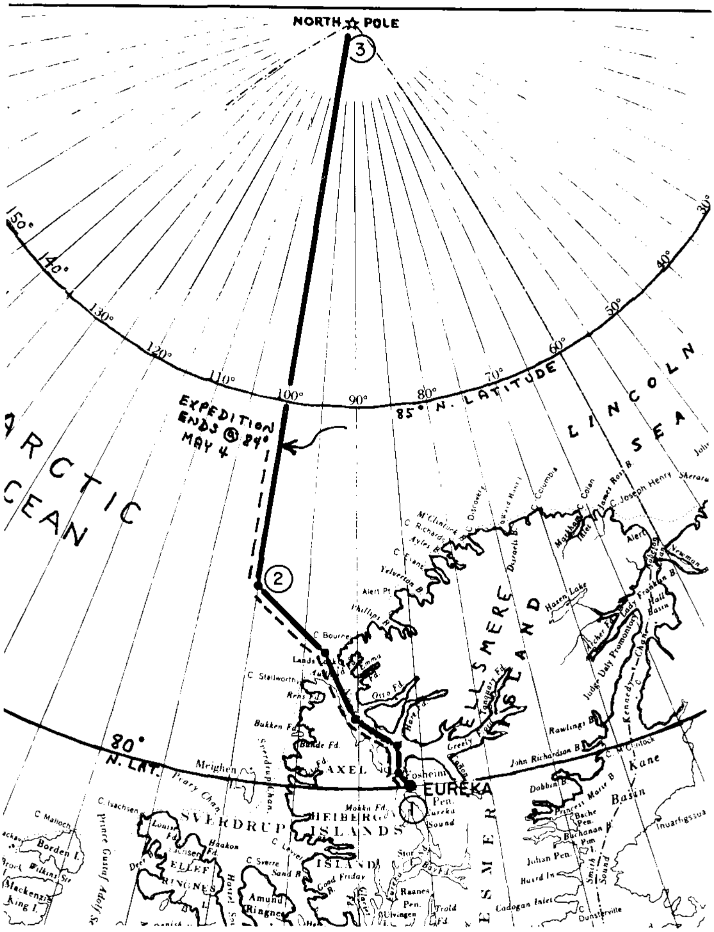
For several weeks in April and May, 1967, upper midwest radio audiences listened tensely for direct radio reports on progress of the journey. Once, the expedition achieved a polar radio link by talking directly with men in the Antarctic via WCCO Radio in Minneapolis.

Dr. Arthur C. Aufderheide (Med. '46) was a member of the Plaisted Polar Expedition. The Duluth pathologist is a veteran of much adventure in the Canadian wilds, including a float down the length of the great Mackenzie River of the north to the Arctic ocean.

Although the expedition failed to reach the North Pole, their journey stirred the hearts of a host of armchair adventurers. Armed with new knowledge, the group is already planning a new assault on the Pole in March, 1968.

Here is Dr. Aufderheide's report on his adventure, excerpted from diary entries and illustrated with his own photographs:

On March 24, 1967, the 16 members of the Plaisted Polar Expedition flew from Montreal on an RCAF aircraft to Eureka, a tiny weather station on Ellsmere Island, the most northern of the Canadian arctic island archipelago. Our goal: to proceed up the 165 miles of Nansen Sound to the edge of the moving ice pack of the Arctic Ocean and then traverse the surface of



Planned Track of the Plaisted Polar Expedition

the pack ice to the North Pole using small, 250 pound ski-and-track-equipped snowmobiles. My job with the group: Clothing design; still photography; field medical officer with the ice party and assistant navigator.

The following excerpts from my diary may provide a glimpse into the nature of the escapade:

> **30 March:** -44° F, clear, wind N, 14. Two day whiteout cleared. Enveloped in the chaotic beauty of the mountains and glaciers surrounding Nansen Sound . . . Snowmobiles functioning well . . . Saw 2 musk oxen today.

1 April: Behind schedule: snowmobiles work well but too much surplus equipment and party too large . . . Easy to keep warm but hard to keep dry (sweat condenses inside insulative layers of clothing).

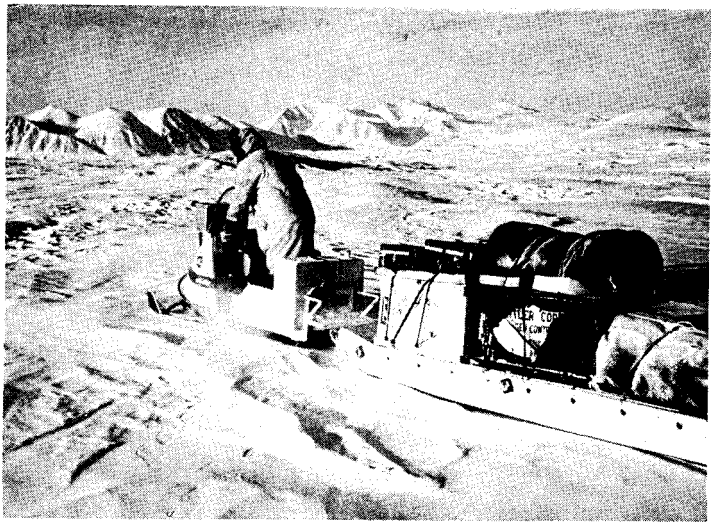
2 April: Arrived mouth of Nansen Sound . . . 24 hour sun now . . . Abandoned igloo construction—snow too soft up here—will use double wall tents only.

3 April: Aircraft brought fuel and supplies. Short ice recon flight: shore "lead" (open water between ice floes) of about ½ mile going to be tough to cross . . . reduced size of ice party.

10 April: Marooned on a floe drifting in open water off the shore lead last 2 days; wind today shifted ice and closed lead . . . pack ice covering ocean made up of fragments ("floes") about 5-6 feet thick and 500-1000 feet diameter with a peripheral ring of jumbled ice 10-25 feet high around each floe.

12 April: Have abandoned Eskimo *komatik* "runnered" sledges—they sank in soft snow; flat-bellied fiberglass sleds better . . . surprised polar bear eating seal.

Dr. A. C. Aufderheide, the author, taking a "sun shot" with marine sextant to establish position on polar pack. Expedition actually covered about 400 miles.



First leg of the trip was on the smooth ice of Nansen Sound

13 April: Clemens broke through thin ice of lead but was promptly recovered without incident . . . Drawing intravenous blood samples for CR51 RBC study is nuisance–blood freezes in needle.

15 April: 35 foot continental shelf ridge of ice toughest obstacle to date–required 1½ days to traverse the mile or so of rough ice just to get to it . . .

17 April: At least half of the pressure ridges of ice require preparation of a path through them for our equipment–each ridge costs us from 15 minutes to 2 hours and there are 3 or 4 ridges/mile. No wonder we're behind schedule . . .

18 April: Have discarded all except hand tools (chisels and axes). We're learning. Progress improving.

21 April: Had 2 day blow. Total whiteout . . . generally weather has been good . . .

22 April: Generator for radio broken–fragmented connecting rod. Disassembled and discarded motor; ran generator off snowmobile drive pulley by handholding it. Poor but adequate radio contact with base camp . . .

24 April: Cold weather has minimized problem of open-water leads formed when floes separate; when it's cold leads freeze quickly . . .

Snowmobile travels ridge of jumbled ice on the polar ice after work party chopped a path.

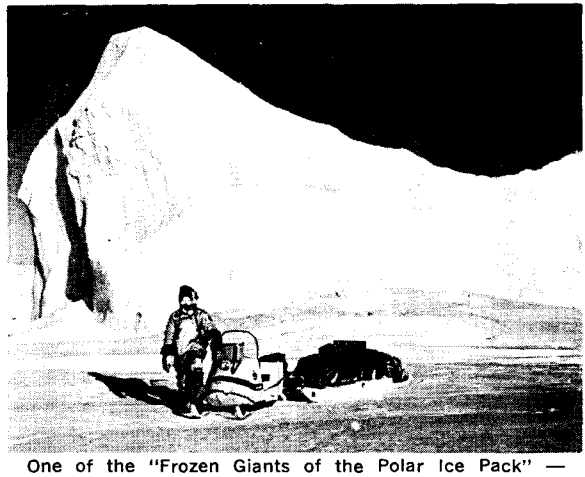
While the remainder of the group establish camp below, a scout surveys the "shore lead" (dark streak on horizon) from a hill at the edge of the polar ice pack, at the mouth of Nansen Sound.

A snow-encrusted lone bull Muskox. These almost prehistoric animals are now nearly extinct.

25 April: Our travel techniques have finally evolved an effective method of pack ice travel: climb a pressure ridge, pick a route; use hand chisels and axes to smooth a path through the pressure ridges while a "scout" moves ahead to plan further route. Got the right combination of sleds, men and snowmobiles now. One hazard; we learned the hard way not to separate the party during active ice movement—leads may form quickly and separate the party.

26 April: Thirty north miles today in spite of a gray-out. Our travel techniques are effective but I think it took us too long to learn them—this good weather can't last long enough to get us to the Pole but if spring is on schedule we should have another week or 10 days left and this ought to get us to about 88° latitude.

27 April: Bad news. 30 mph wind produced zero visibility but worse; it's a *south* wind and it's warm



One of the "Frozen Giants of the Polar Ice Pack" — an iceberg.

(only -10° F); this may mean an early spring; if so, we're done . . .

30 April: Wind averaging 50 mph past 3 days now; questionable if tents will survive; hope they will because if *they* don't, *we* don't . . . radio generator broke during transmission; can't operate it manually during storm.

2 May: This is the 7th day of the blow . . . have been on 1 meal/day—adequate when not working. Throughout blow the camp chores have been limited to within 10 feet of the tent, the limit of visibility . . . 20 minutes is maximal time possible outside tent . . . our ice floe still holding together.

3 May: Blue sky! But trip is over—the spring storm shattered the ice pack—leads everywhere and at +10° F. they're not freezing very fast . . Jury-rigged the generator for radio and called for plane tomorrow (Eureka socked in today).

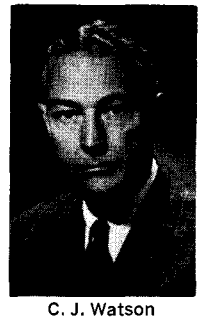
4 May: Abandoned ice camp @ 84° N. Barely in time too—another blow moving in only 60 miles away. Evacuated by air . . . Disappointed at not reaching Pole—we developed an effective travel technique but too late . . . All research projects carried out successfully . . . If we apply what we learned, should have good chance of making it next year . . . It's been an incredible and delightful personal experience.

Special Article

The Old Art and the New Science*

Cecil J. Watson, M.D.†

I am most pleased to have been asked to talk to you on this occasion toward which you have all been striving in the last few years, the beginning of your work in the Medical School. Among the various disciplines which attract students, some are arts and some are sciences. Relatively few partake of both, and of these, medicine is perhaps the outstanding example. But in this age of great scientific advance there is a danger that the art of medicine may become submerged in the depth of its science. It behooves every physician and indeed, every medical student, to strive to know and appreciate the art of medicine at the same time that he diligently studies its growing science.



C. J. Watson

You would do well from the outset to begin a learning process which you will continue throughout your careers, seeking to broaden your knowledge of what the art has meant in medical history and its significance for you in the care of the sick. If you cultivate this pursuit on a broad basis, such as I shall refer to in a moment, I can assure you that it will give you increasing pleasure and satisfaction as the years go along and your experience increases. It is safe to say that if you do this you will gain in much greater degree the respect and even the love of your patients because it is, after all, the art of medicine and not the science which they can understand and appreciate.

The art of medicine is indeed timeless. It is often thought to have commenced with Hippocrates whose great contributions have justly made him regarded as the Father of Medicine. His reputation is partly due to the fact that he wrote things down

*Address to the entering Freshman Class, University of Minnesota Medical School September 22, 1967

†Distinguished Service Professor of Medicine, University of Minnesota; Director, University of Minnesota Unit for Teaching and Research, Internal Medicine, Northwestern Hospital, Minneapolis, Minn.

in careful detail. He spoke with the authority of his great experience which at the same time brought him that humility which is such an important component of the well-developed physician. Every physician should know the first aphorism of Hippocrates and keep it in mind: *"Life is short and the art long, the occasion fleeting, the experience fallacious, and judgment difficult. The physician must not only be prepared to do what is right himself but also to make the patient, the attendants and externals cooperate."*

This at once reveals Hippocrates as the reflective philosopher and the practiced physician. It emphasizes the extent of the medical art and its diversification. But Hippocrates was scarcely the first to practice the art of medicine. About 3,000 years before him there was a great Egyptian genius, Imhotep, who was perhaps the first to pursue the science of mechanics in architecture, the building of the first step pyramid of Zoser. But at the same time, Imhotep was actually worshipped as a god because of his knowledge of the art of medicine; indeed, some have sought to identify him with Aesculapius, the god of medicine of ancient Greece.

Science in medicine had its beginnings much more recently but for many centuries only in the basic sciences, anatomy and physiology. Perhaps the first application of the scientific method to clinical medicine came with the discovery of percussion and auscultation by Auenbrugger and Läennec in the 18th and 19th centuries, respectively. These methods, depending upon the physics of sound, compose an important part of the contemporary physical examination but it must be said that they partake of the art as well as the science. Perhaps even more important is simple observation and this is part and parcel of the old art.

By Observation Only

Observation of the signs of disease, though not quite as important as taking a careful history, were together all that a physician had, prior to the 19th century, with which to decide as to the nature of the patient's illness and the prognosis or outlook. Thomas Sydenham, the great physician of the 17th century, had nothing more than these, yet he was able to make great advances in the description and classification of human disease. All too often, though he might recognize a disease entity, he was without methods of treatment. He had opium for pain and he knew that quinine or the "bark" as it was then called, was good for certain fevers, in retrospect, mainly malarial. He was aware that mercury was of value in the treatment of the "pox", the term then used for syphilis in contradistinction to smallpox and chickenpox. Little more did Sydenham have

but his good powers of observation, and his ability to comfort his patients and give them hope.

History-taking is still the center of the physician's art; indeed, it is the prime requisite in the investigation of any patient's illness. It is safe to say that taken at large, it outranks all of the other methods of the total study leading to a definitive diagnosis and treatment. The great American clinician, Louis Hamman, used to say *"let me take the history and I will accept the physical examination of any intern"*. It is perfectly true that in any given case a physical finding, an X-ray finding or a laboratory result may be decisive in establishing the diagnosis. However, without the careful history to guide him, without the observation that accompanies the history, (i.e., the art rather than the science,) the physician, if he tries to reach his goal through scientific methods alone, is likely to be wandering in a forest of laboratory and X-ray data obtained more or less at random. These may be even more confusing than helpful, not to speak of the great expense at which they were obtained. The history guides the physician to an appropriate selection of laboratory and X-ray procedures, thus leading much more expeditiously and inexpensively to the correct answers.

Let me give you an example or two as to what I mean, culled from the Book of Experience. A middle-aged woman consulted a physician because of weakness, tiredness and a change in her color. The busy doctor, at once observing that she was anemic, packed her off without further questions to the laboratory, where his diagnosis of anemia was confirmed, together with the report that the red blood cells were larger than normal. This, together with his observations that her color was slightly yellowish, led the busy doctor all too quickly to the diagnosis of pernicious anemia. The patient was given an injection of vitamin B_{12} and told to return in three weeks. At this time, to the doctor's surprise, the anemia had not improved; indeed, it was slightly more marked. He gave her another injection of B_{12} and added iron. Another three weeks elapsed but again the anemia had become still more marked and the patient's symptoms no better. Then for the first time the doctor took a detailed history.

He found that for the past two years the patient had had an increasing intolerance to cold, that she had to bundle up more and wear overshoes in even relatively warm weather, and that she now used more bed covers than her husband in contrast to what was previously true. Taking more time to listen to her and at the same time observe her, the doctor saw that the hair was somewhat thin, the eyebrows sparse, and she said that the hair as well as the skin had become increasingly dry. He felt the skin here and there and noted that it was peculiarly thick-

ened as well as dry. On talking more at length with her, he noticed that her voice was hoarse and she told him that this had been increasingly true in the last six months. With this guiding information he then recognized that this was probably myxedema and then obtained the essential laboratory information, namely, that the serum protein bound iodine was markedly diminished. Administration of thyroid soon resulted in striking benefit with gradual disappearance of the anemia.

Lead Poisoning

Another example: An intelligent young man of 25, a graduate student, went to his doctor because of severe recurrent abdominal pain and weakness. The doctor found that he was anemic and additional laboratory evidence indicated that the anemia was due to a more rapid rate of destruction of the red blood cells, but the cause was not clear and the diagnosis remained undetermined for a number of weeks during which time additional laboratory and x-ray procedures were unrevealing. The history of abdominal pain and anemia, amongst other things, should suggest the possibility of lead poisoning. This had been considered but discarded because of lack of history of exposure. With this possibility in mind, further detailed questioning, with special reference to his beverages and drinking habits, finally reminded the patient that for over a year he had been drinking whiskey cocktails out of some old glasses purchased at a rummage sale. And he had noted that if he rubbed his finger around the inside of the glass, a dark powdery material came off.

A glass was soon obtained and rinsed with a small amount of nitric acid which was submitted for lead analysis. It contained no less than 40 mg. of elemental lead. Subsequent lead analyses of the urine and blood confirmed the diagnosis of lead poisoning which was quickly cured by repeated courses of the chelating agent, calcium versenate. Parenthetically, this true story is reminiscent of something that archeology has recently taught us about the Decline and Fall of the Roman Empire, i.e., that it was assisted by lead poisoning, due to drinking wine from lead beakers.

It is not my purpose today to attempt any instruction in clinical medicine but simply to emphasize at this early stage of your medical education that the old art of medicine, as exemplified by history taking, is still extremely important and should under no circumstances be omitted or bypassed. A short time ago I read a prediction by Glenn Seaborg, chairman of the Atomic Energy Commission, that it would not be long before doctors could be saved the time of history taking, his suggestion being that a technician would simply program the patient's his-

tory for use in a computer which would then deliver the correct diagnosis, or the indicated procedures to obtain the diagnosis.

Although I am sure that computer techniques will be of great value in clinical medicine as well as medical research, it would be a colossal mistake to divorce the physician from taking the history himself and instead turning it over to a technician and a computer. The fact is that taking the history is the doctor's opportunity to make a very important personal contact with the patient. It is essential that he become acquainted with the patient's personality, background, habits, family, his outlook on life and his manner of thinking. By means of appropriate sympathy and understanding, he can gain the patient's confidence. Very often, only when he has gained it in this way will the essential features of the history come out. This is particularly true in situations where there is a so-called psychosomatic component. Without this the physician may never suspect that the headache or abdominal pain of which the patient complains is strictly related to some psychobiological abnormality rather than an organic disease.

The Heritage of Medicine

At the outset I indicated that you would enjoy and profit by some reading of medical history in conjunction with your curriculum. Every physician ought to be aware of his heritage in medicine and ought to have at least a speaking acquaintance with the lives of the great students of medicine and of their discoveries. When you are studying anatomy, you ought to read something about the fascinating life of Vesalius, who overthrew some of the dogma of Galen, which had held sway for a thousand years. When you are studying physiology you ought to read at the very least about Claude Bernard, and in relation to microbiology about Pasteur and Koch. The lives and accomplishments of these great men make enjoyable and stimulating reading. As physicians you ought in any event to cultivate a taste for biography which, as Samuel Johnson once said *"is the cream of literature"*.

In saying this I open the door to what I regard as an unfortunate situation in medical education, one that is much too widely neglected. This relates to the increasing predominance of the new science over the old art. The old art definitely included the humanities. The physicians of a former day often continued their study of the humanities during their medical curriculum. This, it must be said, was in a time when the body of scientific knowledge in medicine was quite small and not so overpowering as at present. Because of his broader acquaintance with the arts and letters than is generally characteristic in the

present age, the physician of the past often commanded more respect, and his cultural attributes helped in gaining him the admiration and confidence of his patients. I greatly fear that if, as often appears true, the curtain goes down on the humanities when the medical student commences his medical curriculum as you are doing today, the cold new science is likely to become altogether too dominant, crowding out the old art and with it some of the respect, the compassion and the understanding. Even today, however, a medical student who recognizes the need of holding the curtain up to some extent can unquestionably do it though I grant it requires perseverance and resolve, amongst other things, to devote but little time to television.

I recommend to you that method which the great medical humanist, Sir William Osler, believed best suited for the medical student and physician whose days are so crowded, namely, some reading from the classics for a half hour or so before going to sleep each night. On the basis of my own personal experience with this method, I can assure you that it will enrich your lives by a great deal. For several years now an attempt has been in progress in this Medical School to keep the curtain from falling by means of monthly talks on the humanities, given at the Medical School for its students by selected members of our University arts faculty or guests from other institutions. Many of these lectures have been superb and quite a number of the students have told me how much they appreciated them. I was most pleased to learn that the program is to be continued this year and, I hope, henceforth. On a once a month basis for three quarters it could permit each student to attend 36 lectures on the humanities during his medical curriculum. This, I think, would represent a not inconsiderable contribution to his culture and to the maintenance of the old art.

Let me say that in years to come you will no doubt look back upon these four years that you are now commencing with the realization that it was a wonderful time, a stimulating period—new friends and teachers, new ideas, great challenges, fascinating methods and techniques—and a beginning exposure to that ever changing face of medicine. In wishing you well, let me hope that the old art will not be submerged in your thoughts and activities and that you will all strive to be medical humanists in some reasonable degree.

Cancer Research

The Thymus and Spontaneous Mammary Adenocarcinoma in Mice*

(Dedicated to the memory of Prof. Carlos Martinez)

Edmond J. Yunis, M.D.*

In recent years it has been established that the thymus plays an important role in developmental immunity in mammals. It has also been shown that thymus dependent immune mechanisms may be important in development, maintenance, and final outcome of some induced malignancies.

In experiments performed in our laboratories, it was found that thymectomy at six days of age in mammary tumor virus (MTV) infected female C3H mice either reduced the host's resistance or increased the latent period in development of mammary adenocarcinomas.

Four factors which appear to be necessary for the development of spontaneous mammary carcinoma in mice are:

1. Mammary tumor virus excreted in the milk of cancer stock mothers.

2. The thymus.

3. A genetic susceptibility due to one or more dominant genetic factors.

4. A hormone influence which may or may not be associated with breeding.

To further investigate the importance of the thymus in mammary carcinogenesis in mice, experiments were performed in C3H female mice which had been thymectomized at birth. Immunological deficiencies and wasting disease were prevented by either thymus grafting or by the injection of syngenic spleen cells. It was found that neonatally thymectomized female C3H mice, when grafted with syngenic thymus from animals either having or lacking the MTV, developed mammary tumors as fre-

*From a report to the Staff Meeting of University Hospitals on October 13, 1967.

†Associate Professor, Department of Laboratory Medicine, University of Minnesota

quently as did sham operated controls. By contrast, neonatally thymectomized mice treated with spleen cells obtained from MTV infected C3H mice, susceptible to development of spontaneous mammary carcinoma, had a reduced incidence of tumors and a prolonged latent period of tumor development. By contrast, neonatally thymectomized mice treated with spleen cells obtained from C3H mice which lacked the MTV agent show reconstitution of the ability to develop spontaneous mammary carcinoma.

Removal of the thymus in the neonatal period might either prolong the incubation and reduce the incidence of malignancy by (1) altering the immunologic relationship of host to virus or (2) providing an important site for virus replication or latency.

The thymus may be important in the life cycle of the virus either in the passage from the gastrointestinal tract to the hemopoietic cells or from these cells to the mammary tissue. Since a tolerant state to the virus exists in the C3H mice, our results can be interpreted to indicate that the thymus may be important in the negative adaptation (tolerance) to the virus. The absence of the thymus would prolong the latent period of cancer development, mainly by prolonging the tolerant state. Alternately, it may also be that thymectory decreases the rate of tolerance breakdown, after which time a virus-host cell interaction, possibly combined with an immune response, may lead to cancer cell formation. Enhancing antibodies produced by the nontolerant cells may also play a role in malignant development.

Experiments should be performed to determine whether cancer develops following either the negative adaptation (tolerance) to the virus or the termination of this tolerant state.

Pediatrics

Studies on the Pathogenesis of Diffuse Glomerular Disease*

Alfred F. Michael, M.D.*

Causes of the various forms of human glomerular injury are unknown. These diseases include idiopathic nephrotic syndrome, acute post-streptococcal glomerulonephritis, lupus nephritis, subacute and chronic glomerulonephritis, Goodpasture's disease, anaphylactoid nephritis, and diabetic nephropathy. Improved understanding of some of these diseases is derived from two correlated lines of investigation: (1) Studies of certain experimentally-induced renal diseases, and (2) Characterization of the role that immune mechanisms play in human kidney disease. Both of these approaches involve primarily immunopathologic studies on diseased kidney with correlative light and electron microscopy.

Sporadic acute post-streptococcal glomerulonephritis is characterized by a preceding streptococcal infection, a fall in serum complement, and the presence of nodular deposits of gamma globulin (IgG) and complement (B_{1c}) along the epithelial aspect of the glomerular basement membrane (GBM). By thin-section light microscopy and electron microscopy, dense deposits are seen in a similar location. This picture is similar to that which occurs in antigen-antibody complex disease in rabbits as shown by Dixon *et al* and Fish *et al*. In lupus nephritis, an analogy to complex disease is also suggested by the demonstration of deposits within or adjacent to the GBM. In certain types of chronic glomerulonephritis characterized by proteinuria and nephrotic syndrome, numerous intramembranous deposits of immune globulin are present within the GBM. The exact nature of the antigen in all of these diseases is unknown. In experimental complex disease the IgG has no immunological specificity for the glomerulus and its localization depends on other factors such as renal blood flow and the unique filtration and phagocytic function of the glomerulus. For example, aggregated gam-

*From a report of the Staff Meeting of University Hospitals on October 6, 1967.
†Associate Professor, Department of Pediatrics, University of Minnesota.

ma globulin, which has many of the biologic properties of complexes, localizes in the mesangium of the glomerulus after administration to mice. That such a situation does not explain deposited immune globulin in human disease is suggested by an L-chain localization which does not reflect the circulating pool (*cf.* Herdman, *et al*).

The deposition of immune globulin in the GBM in a linear, uninterrupted, and non-nodular pattern has been demonstrated in certain types of glomerulonephritis, including Goodpasture's disease. This correlates with the membranous dense material and absence of extra-membranous deposits seen by electron microscopy. This picture is similar to that seen in experimental disease where antibody is formed against and reacts with GBM, *e.g.*, nephrotoxic nephritis. Dixon *et al* have recently shown that IgG eluted from Goodpasture's disease kidney has GBM specificity.

In contradistinction to these diseases in which immune mechanisms play a relatively major role are the findings in idiopathic nephrotic syndrome. In this disease there is usually responsiveness to steroid therapy, a normal serum B_{1c} level, normal or minimally abnormal glomerular morphology and absence of immune globulin deposition in the GBM. It is probable that in this disease proteinuria results from reversible changes in GBM permeability. The reason for this is unknown although recent studies in aminonucleoside nephrosis by Blau and Michael have shown a decrease in hydroxyproline content of the GBM.

The therapy of glomerular disease other than idiopathic nephrotic syndrome has been disappointing. The use of azathioprine-steroid therapy has resulted in an increase in glomerular filtration rate and a decrease in proteinuria in a significant number of patients especially those with immune-related proliferative glomerular injury.

Dermatology

Radioactive Monitoring of Degranulating Mast Cells*

Harry I. Katz, M.D.,† Ramon M. Fusaro, M.D., Ph.D.,‡ and Q. T. Smith, Ph.D.§*

Immediate types of allergic hypersensitivity reactions are encountered in all fields of medicine. At present the detection of most of these reaction states by a simple, reliable and reproducible laboratory technique is not available. This is especially true for the immediate type of drug hypersensitivity states in patients. The clinical history of such an allergic reaction in a patient remains the only reliable guide for the clinician in the detection of these hypersensitivity states.

The circulating basophil/tissue mast cell systems are involved in these drug sensitivity reactions. Attempts have been made to monitor the circulating basophil and tissue mast cell systems during immediate hypersensitivity reactions; however, these have not met with universal acceptance. In an attempt to monitor alterations occurring in mouse peritoneal mast cells, we have used a radioactive isotope technique ($S^{35}0_4$) to determine the release of labeled sulfated acid mucopolysaccharides from these tissue mast cells after the cells have been subjected to a known mast cell degranulating substance—compound 48/80.

Methods

Fourteen laboratory strain female mice weighing approximately 25 grams each were given 40 microcuries of ($S^{35}0_4$) IM. Two days later the mice were exsanguinated and sacrificed. Immediately nine animals were given IP 2 ml. of Ringer Barron salt solution containing 0.2 mg. of compound 48/80. A control group of five mice was given the same solution without the

*From a report to the Staff Meeting of University Hospitals on Oct. 27, 1967; Support for this preliminary report is from USPHS Grant No. AM-11344-01.

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compound 48/80. After 15 minutes the fluid was aspirated from the peritoneal cavity and immediately filtered through a 3 micron millipore filter. The acid mucopolysaccharides in the filtrate were isolated by a modification of the technique of Schiller, Solver, Dorfmann (1961). The radioactivity of the isolated sulfated acid mucopolysaccharide was determined in a gas flow counter. The radioactivity (above background) of the sulfated acid mucopolysaccharide was equated to the volume of aspirated peritoneal fluid from each animal.

Results

The Table shows the radioactivity of the sulfated acid mucopolysaccharide isolated from each animal.

Control Mice	*48/80 Treated Mice*
(counts per minute above background per ml. of aspirated peritoneal fluid)	
5.2	13.2
9.6	9.9
3.4	31.2
5.4	25.2
5.6	18.6
	17.1
	7.8
	29.3
	23.3
average 5.8	average 19.4
± S.D. 2.1	± S.D. 7.8

Alteration in the circulating basophil/tissue mast cell system have been examined by morphologic, chemical, and bioassay methods. Morphologic techniques have proven inadequate because of the difficulty in defining microscopic changes in morphology of the cells. Rodent tissue mast cells have been shown to contain histamine, serotonin and sulfated acid mucopolysaccharides. Chemical and bioassay techniques for these substances are technically difficult at the microanalytical levels needed to study small populations of tissue mast cells.

The use of a radioactive isotope technique to label the sulfated acid mucopolysaccharide of rodent mast cells is not new. Lagunoff, Calhoun and Benditt (1960) found that 48 hours after IM injection of ($S^{35}O_4$) the majority of the radioactivity

in cells obtained from a peritoneal cavity washing was in the mast cells. Other cellular elements in the peritoneal washing had insignificant amounts of radioactivity when compared to the mast cells. Compound 48/80 is known to degranulate mast cells. Our results demonstrated that we can monitor the release of sulfated acid mucopolysaccharide from mast cells with the above method. Our counts were three times greater from the 48/80 treated mice than that from the control animals and were significantly different ($p<0.01$). The technique provides sensitivity such that the reaction may be monitored in a single animal rather than in pooled samples as required in previous reports.

The degranulation of basophils and tissue mast cells during an immediate hypersensitivity reaction and the release of such pharmacologic agents as histamine is well known. It is anticipated that with the radioactive method we have described, we will be able to monitor the release of sulfated acid mucopolysaccharides from tissue mast cells which are involved in an immediate hypersensitivity reaction.

Medical School News

Family Practice of Medicine Under Study

Revision of the Medical School's curriculum to provide more doctors trained to serve as family physicians will be studied by the University under a mandate of the 1967 Legislature.

Actually, work on such a study began last February when a Division of Family Practice and Community Health was formed in the College of Medical Sciences with Dr. Richard V. Ebert, Head of the Department of Medicine, as Chairman.

An appropriation of $50,000 a year for a two-year study of problems associated with the establishment of a family practice program was requested. The Legislature appropriated no funds for the work, although it endorsed the project and called for a written report on the study to be submitted to the House Appropriations and Senate Finance Committees by September 15, 1968. The study will continue, however, according to Dr. Robert B. Howard, Dean.

The problem of declining numbers of family practice physicians serving the public has concerned the medical profession for years, Dr. Howard said. The 1966 Hill Family Foundation Health Manpower Study for the Upper Midwest found that the proportion of general practitioners among doctors in Minnesota dropped from 95 percent in 1910 to 41 percent in 1960.

"The decrease in physicians in general practice, both in proportion and number, has created an issue of deep and complex implications," Dr. Howard stated. "At the center of the issue is the increased tendency of physicians to specialize in their practice of medicine for a wide variety of reasons. This trend toward specialization is neither enforced nor arbitrary; but rather, it stems principally from a basic human urge to understand as much as possible about the work one has chosen to call his own."

Factors to be considered in the study include problems of the practicing physician, especially the family physician; the need for the family physician; his function in the community; experiences of other states with incentive and preceptorship programs in family practice; the appropriate course of study for modern family practice; and the education of medical students toward a specialization in family practice designed to provide treatment of the "whole man."

Education for family practice will involve undergraduate and graduate training as well as a continuing education program for the doctor after he goes into practice.

Among the problems to be considered by the study are the kind of faculty and associated staff required and the clinical facilities that would be necessary to operate a family practice program at the University. Consideration will be given to the use of satellite clinical facilities—perhaps some in a rural environment.

A family practice program at the University might well be expected to incorporate much of the material now used in the Medical School's Comprehensive Clinic Program. It has been part of the medical education undergraduate program since 1960 and gives medical students personal experience with patients who come to the University Hospitals seeking help for a wide range of ailments.

A task force of faculty and non-faculty members has been named to carry out the family practice study. This study group is a sub-committee of the Medical School's Educational Policy Committee; Dr. Ebert heads both groups.

Executive Director of the study is Dr. Benjamin F. Fuller, Assistant Professor of Medicine. Non-faculty members of the group, both members of the Minnesota Academy of General Practice, are Dr. Herman E. Drill of Hopkins and Dr. Edward Ciriacy of Ely. Dr. Drill is a former President of the Minnesota Medical Foundation.

Faculty members, in addition to Drs. Ebert and Fuller, are Dr. Richard M. Magraw, Director of the Comprehensive Clinic Program; Dr. Edward DeFoe, Assistant Director of the Program; Dr. Lyle A. French, Head of the Neurosurgery Division; Dr. Robert J. McCollister, Assistant Dean of the College of Medical Sciences; Dr. Donald W. Hastings, Head of the Department of Psychiatry and Neurology; Dr. Glenn Gullickson, Jr., Director of the Rehabilitation Center; and Mr. Peter Sammond, Associate Director of University Hospitals.

Barnum Society Holds First Colloquium

The first annual Colloquium of the Cyrus P. Barnum, Jr. Society was held on Friday, July 7, 1967 in Mayo Memorial Auditorium.

Pres. Michael Stenwick welcomed guests and outlined the purpose of the organization. The society was formed in July

1965, by those students on the University's combined M.D./Ph.D. training program to serve as a link in communication among the combined students. Up until that time the diversified interests of people on the combined program had prevented any unified discussion of common problems and goals. Since its organization, the Society has held bimonthly meetings at the homes of various faculty members. At present the society is composed of 26 members.

Following the tragic loss of Dr. Barnum in the summer of 1965, the society unanimously decided to adopt his name with the approval of Mrs. Barnum. It seemed so appropriate to take the name of the man whose interests were as broad as the entire membership of the society and who had set a standard of teaching which is now legendary.

Dorr Dearborn, former graduate student of Dr. Barnum, who is a present member of the society, gave the memorial address. He emphasized three attributes of Dr. Barnum's character: personal integrity, humility, and dedication.

Guest scientific speaker for the colloquium was Aaron B. Lerner, M.D., Ph.D., Professor of Dermatology at Yale University. Dr. Lerner, who received his Ph.D. in biochemistry from the University of Minnesota with Dr. Barnum as his major advisor, spoke on "Pituitary Peptides—Old and New."

To emphasize the wide spectrum of interests of people in the society, the remainder of the Colloquium was devoted to five 20-minute presentations of research projects currently in progress by students on the combined program. They were the following:

(1) Dean Abrahamson: *"Microspectrophotometry Applied to Quantitative Histochemistry"*

(2) Ronald Blackmore: *"Short Chain Fatty Acid Metabolism of Heart Mitochondria"*

(3) Richard Hill: *"Chromosomal DNA Replication Patterns of the Sex Chromosomes During Mammalian Development"*

(4) Thomas Rolewicz: *"Cutaneous Vasodilatation Elicited by Sympathetic Nerve Stimulation"*

(5) David Levitt: *"Intestinal Absorption of Xylose"*

Alumni Notes

Beginning residencies in the Mayo Graduate School of Medicine, Rochester, Minn. this fall are **Lonnie L. Hammargren** (Med. '64), neurosurgery; **Thomas P. Lake** (Med. '64), radiology; and **Richard C. Siebert** (Med. '63), neurosurgery. Others on continuing programs are **Charles L. Johnson** (Med. '66), surgery; **David B. Plimpton** (Med. '66), internal medicine; and **Stephen Hodgson** (Med. '64), internal medicine.

New appointments at Mayo Clinic include **Malcolm I. Lindsay, Jr.** (Med. '61), who was named a consultant in internal medicine; and **Ralph A. Nelson** (Med. '53), who was appointed head of a new Section on Nutrition, with additional responsibilities for supervision of animal research facilities at St. Mary's Hospital, Rochester. **Roderick P. Hood** (Med. '61) was named an associate consultant in internal medicine.

Ralph Nelson

Malcolm Lindsay

Dr. Thelander

◆ **1904**

William A. Brand, Redwood Falls, Minn. writes: "In the write-up of *Our Senior Alumni,* April issue, it was stated that I was in practice 36 years. It should have been 63 years. I came to Redwood Falls in 1904 and have been here ever since. Am a real Horse and Buggy doctor."

◆ **1924**

Hulda E. Thelander, San Francisco pediatrician, received an honorary Doctor of Laws degree from the University of California at the June, 1967 commencement program.

◆ **1925**

Joseph W. Dassett, Whittier, Calif., has been appointed college physician and director of the Student Health Service at Whittier College. He retired from the private practice of pediatrics on July 1, 1967, and has spent 31 years in Whittier.

◆ **1929**

L. Kenneth Onsgard recently said goodbye to Houston, Minn. after a 37-year career there in general practice. Dr. and Mrs. Onsgard have bought a home in St. Petersburg and are retiring there Nov. 1, 1967. They will live at 5152 Horsheshoe Pl. N.E. The Houston, Minn. Chamber of Commerce sponsored a farewell banquet and presented Dr. Onsgard with a plaque which reads: "*With heartfelt appreciation to our friend, Dr. L. K. Onsgard, for the many years of service to the people of Houston.*" Dr. Onsgard will also be missed at Cross of Christ Lutheran Church in Houston, where he has been director of the choir for 23 years.

◆ **1931**

O. L. Norman Nelson of Minneapolis was elected president of the Minnesota State Medical Association, and is serving for the current year. Olaf M. Heiberg (Med. '34), Worthington, Minn., was named president-elect.

◆ **1932**

Jan H. Tillisch has taken early retirement from the Mayo Clinic, Rochester, Minn., where he was an internist and head of a section of medicine. A native of Canby, Minn., he took his graduate training at Rochester and developed a strong professional interest in aviation medicine. He has been medical director of Northwest Airlines, Inc. since 1940, and in 1963 received the *Boothby Memorial Award* of the Aerospace Medical Association for "outstanding research directed to the promotion of health and prevention of disease in professional airline pilots."

◆ **1934**

Arthur A. Nelson retired this month from the Food and Drug Administration, Division of Pharmacology, Washington, D.C. He will be living at 1714 Corwin Dr., Silver Spring, Md.

George E. Moore

John P. Stapp

Jan H. Tillisch

◆ **1935**

Robert O. B. Quello, Minneapolis, was recently elected to the Board of Trustees of the American Academy of General Practice.

◆ **1940**

John R. Haserick has been appointed professor and head of the Department of Dermatology at Case-Western Reserve University School of Medicine, Cleveland, O. He announces removal of his office from the Cleveland Clinic to 2065 Adelbert Road.

◆ **1942**

Howard A. Andersen, consultant in medicine at the Mayo Clinic, was appointed a member of the Pollution Control Agency of the State of Minnesota by Gov. Harold LeVander.

◆ **1943**

Col. John P. Stapp, a world authority on human tolerance to crash forces and physical stress, has a new assignment from the U.S. Department of Defense: he has been detailed to the Department of Transportation as Chief Medical Scientist of the National Highway Safety Bureau. Col. Stapp, 57, is presently chief of the Impact Injury Section of the U.S. Air Force Medical Corps. He will continue to be located in Washington, D.C., with his address now c/o National Highway Safety Bureau, Room 315A, Donahoe Bldg., Washington, D.C. 20591.

◆ **1946**

George E. Moore, Buffalo, N.Y., has been appointed to the new position of Director of Research for the New York State Department of Health. Since 1953 he has been director of Roswell Park Memorial Institute, the state's cancer research and treatment center. He will continue to be located at Buffalo.

Anthony L. Ourada closed his general practice at Fairmont, Minn. to begin a four-year residency in urology at St. Paul-Ramsey Hospital.

◆ **1950**

Clifford J. Stadem terminated his 16-year general practice in Twin Valley, Minn. to become associated with the Crookston, Minn. Clinic.

◆ **1954**

Donald S. Mattson, former medical missionary with the Wonju Union Christian Hospital in Korea, joined the staff of the Lakeland Medical Center in Willmar, Minn. as an internist.

◆ **1956**

Dr. and Mrs. **Mitchell J. Rosenholtz,** Lutherville, Md., announce the birth of a daughter, Deborah Ann, on Sept. 22, 1967. They live at 29 Ridgefield Rd.

◆ **1958**

Maj. Bruce H. Warren, who is with the Air Force's Aerospace Medical Division, recently received the Texas Air Force Association's "Scientist of the Year" award for his design and development of a new body armor for U.S. airmen in Vietnam. The work developed rapidly after discovery of a high incidence of neck wounds suffered in low level flying missions. Maj. Warren designed a new protective vest and collar, delivered it less than three months later in Vietnam, and tested it personally on six combat missions. He later won the Purple Heart after being wounded on the final mission. He is a native of Duluth and married to the former Jane Berry of that city.

◆ **1959**

Jerome C. Fluth, who has been a medical missionary in Africa for several years, is now on sabbatical leave and is at University of Minnesota Hospitals for a year's study in Physical Medicine and Rehabilitation.

Harry P. Santrizos is now located in Minneapolis, Minn., and is chief of the section of Chronic Diseases, Minnesota Department of Health.

◆ **1960**

John E. Larkin, Jr. is now practicing orthopedic surgery from offices at 1157 Lowry Medical Arts Bldg., St. Paul, and is part-time at the University. John finished his residency earlier this year, and was chief resident in orthopedics at Massachusetts General Hospital, Boston.

John A. Ochsner has become associated in the practice of urology with Drs. James and John Hoskins in Sioux Falls, S.D.

Conrad J. Wilkowske completed an internal medicine residency at the Mayo Graduate School and joined the staff of the St. Louis Park, Minn. Medical Center.

◆ **1962**

Lt. John E. Sutherland, who has been a GP in Marshall, Minn., was inducted into the Navy this fall. His address is c/o Naval Ordnance Station, Indianhead, Md. 20640.

◆ **1963**

Capt. Paul F. Engstrom, now in the Army, has accepted a three year appointment as head of hematology and oncology at Tripler Army Hospital, Honolulu, Haw. His wife, Janet, and two daughters are with him. Paul completed a residency in internal medicine at University of Minnesota Hospitals.

Letters

The Editor:

In the recent edition of the Medical Alumni Directory I noted that a classmate of mine, John D. Greathouse, was not listed. He was in my class, the class of 1939, and interned at Ancker Hospital in St. Paul. He was killed in the South Pacific early in World War II. Would you please see that his name is added to the Directory.

Robert G. Rogers '39
Fargo, N. D.

Alumni Deaths

◆ **1902**

Dr. Minerva Goodman, Stockton, Calif. Died July 1, 1967 at the age of 91 years, after suffering a broken hip. She was among the oldest living graduates of the Medical School and had spent 50 years in general practice in California. (See MEDICAL BULLETIN, April, 1967, p. 231)

E. M. Hammes, Sr.

Andrew D. Hoidale

◆ **1904**

Dr. Andrew D. Hoidale, Tracy, Minn. Died July 25, 1967 at the age of 90 years. He had been ill for several years, and had retired 10 years ago after 50 years of general practice in Tracy, Minn., where he also served as mayor. Dr. Hoidale was a 32nd degree Mason. (See MEDICAL BULLETIN, April, 1967, p. 234)

◆ **1906**

Dr. Ernest M. Hammes, St. Paul, Minn. Died September 30, 1967 at his home at the age of 83 years. He was professor

emeritus of neurology and psychiatry at the University of Minnesota Medical School, and had spent 57 years in practice in St. Paul. Dr. Hammes was president of the Minnesota State Medical Association in 1949, and president of Minnesota Blue Shield in 1960. He served with the Army Medical Corps in World War I, and was among the oldest living graduates of the Medical School. (See MEDICAL BULLETIN, April, 1967: *Our Senior Alumni).* Among survivors are his widow, Douglas, and a son, Dr. Ernest M. Hammes, Jr., of St. Paul.

◆ **1919**

Dr. Arthur F. Smith, Manning, Ia. Died August 30, 1967 at the age of 75 years. He had been retired and in failing health for several years. Survivors include his wife, Mrs. A. F. Smith, and a son and daughter.

◆ **1921**

Dr. Morris H. Litman, Los Angeles, Calif. Died recently in that city at the age of 76 years. He had lived in Minneapolis for 50 years, including a 30 year career with the Minneapolis V. A. Hospital, until moving to California in 1963.

Survivors include two sons, Dr. Robert E. Litman (Med. '43), Los Angeles, and Dr. Arthur G. Litman (Med. '52), Long Beach.

Dr. George E. Richardson, Warrington, Fla. Died May 4, 1967, aged 74, of a self-inflicted bullet wound.

◆ **1922**

Dr. Oliver E. Nelson, Sun City, Calif. Died June 29, 1967 of cancer. He was 74 years old and a veteran of World War I.

◆ **1923**

Dr. Arthur H. Knudson, Milwaukee, Wis. Died May 17, 1967 of a stroke. He was 69 years of age.

◆ **1927**

Dr. Ames W. Naslund, Minneapolis, Minn. Died August 13, 1967 at age 66. He was a member of the clinical faculty in radiology at the Medical School, former chief of radiology at St. Barnabas Hospital, Minneapolis, and a member of Alpha Kappa Kappa.

◆ **1928**

Dr. John D. Keyes, Winona, Minn. Died May 23, 1967, aged 64, of a stroke. He was a former member of the State Board of Medical Examiners.

◆ **1930**

Dr. Melvin S. Martin, Warsaw, N.Y. Died May 5, 1967 at the age of 62 of leukemia. He was a fellow of the American College of Radiology, a Navy veteran of World War II, and had spent 19 years on the staff of Wyoming County Hospital, Warsaw, N.Y.

◆ **1936**

Dr. Roy E. Dow, Detroit, Mich. Died July 1, 1967 at the age of 60.

Dr. George D. Kaiser, Oak Park, Ill. Died June 20, 1967. He was 56 years old and taught surgery at the University of Illinois and Stritch School of Medicine. He had been a surgeon at Hines V.A. Hospital since 1961, and had lived with his wife, Elizabeth, and children in Chicago for 27 years. Mrs. Kaiser was a nurse who studied anesthesiology at the University of Minnesota. The Kaisers met during his internship at University Hospitals.

George D. Kaiser

◆ **1939**

Dr. William E. Proffitt, Jr., Minneapolis, Minn. Died unexpectedly in his sleep on Sept 30, 1967, while at his lake cottage near Cook, Minn. He was 52 years of age, and believed in good health, although he had suffered from a virus ailment late this past summer.

Dr. Proffitt had practiced in Minneapolis since graduation from the University, where he starred in athletics. A native of Danville, Ill., he had entered the University at age 16 and was the youngest player ever to letter in Gopher football, playing as a wingback on Bernie Bierman's fabled teams of 1932-33-34. Dr. Proffitt also lettered in track, baseball, and boxing, and was Big Ten heavyweight boxing champion.

An avid hunter and fisherman, he was also a licensed pilot, and in recent years has served as team physician for the Minnesota Twins baseball club.

Surviving are his wife, Deborah; a son, William III, and daughter, Margaret Ann, all of 5700 Northwood Dr., Edina, Minn.

Dr. Gerald G. Geissler, Tacoma, Wash. Died January 19, 1967, aged 51 years, of cirrhosis of the liver. He was a veteran of World War II.

◆ **1952**

Dr. Paul V. Cummiskey, Walnut Creek, Calif. Died May 4, 1967, aged 45, of barbiturate poisoning. He was a dermatologist and veteran of World War II.

◆ **1956**

Dr. Ralph B. Swanson, Mill Valley, Calif. Died May 5, 1967, by his own hand. He became ill late in 1966. Dr. Swanson, 35, was an anesthesiologist in San Francisco, and taught at the University of California Medical Center. He was a member of Phi Beta Kappa and A.O.A., and an elder of the Presbyterian church. Survivors include his wife, Helen, and three children.

MEMORIALS

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

Karl F. Bielenberg	**Paul H. Bliss**
Mrs. Myrtle Grigg	**John F. Lewis**
Malcolm I. Lindsay, Sr.	**Ethel MacDonald**
Gen. Ray S. Miller	**Mrs. Dorothea Oliver**
Lucian Sinclair	**Anna Sorenson**
Mrs. C. W. Stott	**Lurene and Carlton West**

Kenneth K. Wunsch

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 acknowledge all gifts to both donor and next of kin.

COMING EVENTS

University of Minnesota Medical School

CONTINUATION COURSES FOR PHYSICIANS

1967

Oct. 19 - 21	Dermatology
Oct. 30 - Nov. 3	Radiology (Gastrointestinal)
Nov. 8 - 10	Neurology
Nov. 15 - 17	Ophthalmology (Refraction)
Nov. 30 - Dec. 2	Orthopedic Surgery
Dec. 6 - 7	Pulmonary Diseases

1968

Jan. 18 - 20	Otolaryngology
Jan. 25 - 27	Gynecology
Feb. 8 - 10	Psychiatry
Feb. 19 - 21	Internal Medicine
April 15 - 19	Proctology
April 20	Trauma
April 29 - May 1	Ophthalmology
May 23 - 25	Surgery
May 23 - 25	Anesthesiology

You and Your Will

Alumni and friends of the Medical School are urged to name the Minnesota Medical Foundation as a beneficiary in their will. The following form is suggested:

"I give to the Minnesota Medical Foundation the sum of _____ dollars, to be used in its work by direction of its Board of Trustees for the benefit of the University of Minnesota Medical School."

Funds may be bequeathed for specific purposes. For further information, contact the Executive Director, Minnesota Medical Foundation, 1342 Mayo Bldg., University of Minnesota, Minneapolis, Minn. 55455. Telephone: (A.C. 612) 373-8023.

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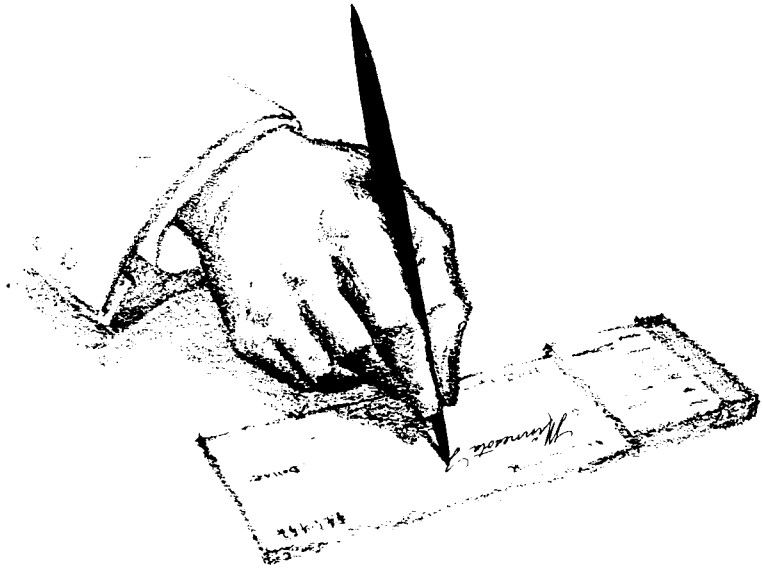

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More than 1,230 members (over 60%) have remitted $25.00 gifts to the Minnesota Medical Foundation in the last two months alone.

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The Board of Trustees thanks the membership for its generous and enthusiastic response to the call for more help. If you have not yet underwritten your $25.00 share in the Foundation's work, why not do so today?

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