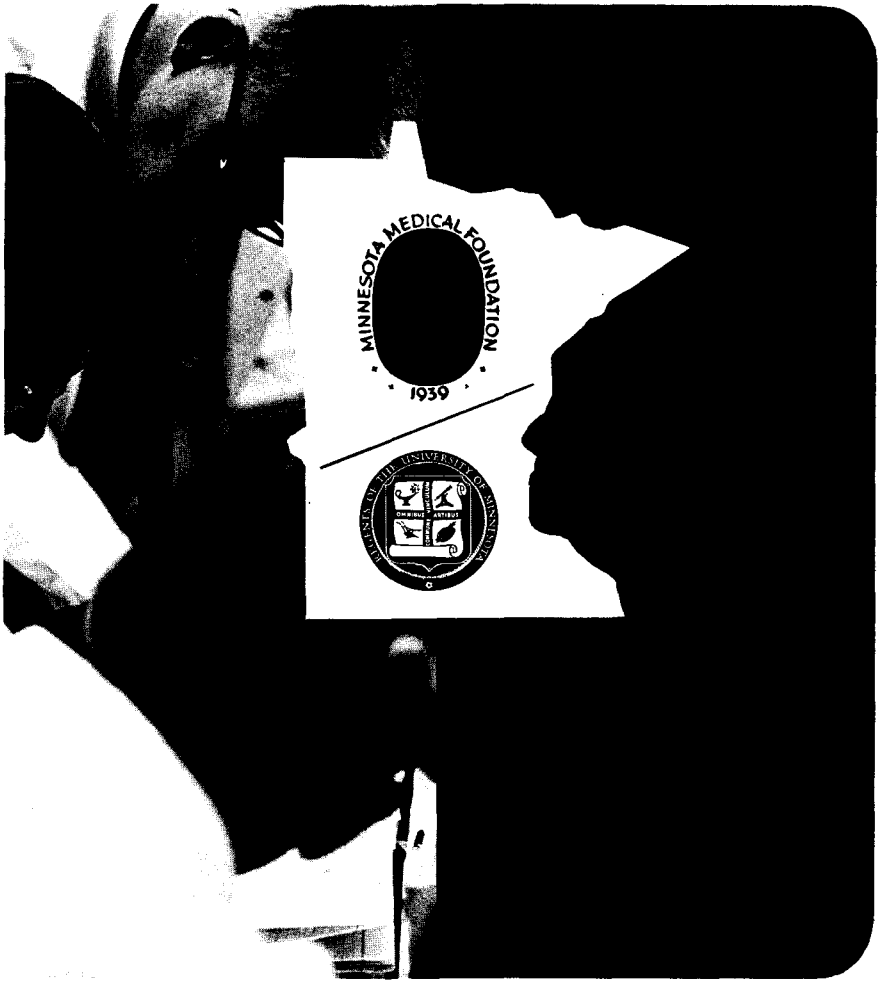


MEDICAL BULLETIN



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THE UNIVERSITY OF MINNESOTA MEDICAL BULLETIN

W. ALBERT SULLIVAN, JR., M.D., EDITOR / EIVIND O. HOFF, JR., EXECUTIVE EDITOR

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Annual Report

MINNESOTA MEDICAL FOUNDATION

June 30, 1968

RECORD levels of aid to the University of Minnesota Medical School continue to be provided by the Minnesota Medical Foundation. The school's philanthropic arm is presently noting its 30th year of service, and its 10th year of full time operations. More than \$5,000,000 in assets are now undergirding the program.

SCHOLARSHIP AWARDS

Eighty five medical students received scholarships from the Foundation in ceremonies held September 23, 1968. The aggregate award was \$51,800, or a 32% increase over 1967, when \$39,300 was awarded to 71 students. Since the inception of the Scholarship Fund Program in 1949, a total of \$389,320 has been provided in the form of 722 individual awards.

This year the Foundation provided \$750.00 scholarships to about one-half of the awardees. It is the intention of the Foundation to raise the level of all Foundation scholarships to a minimum of \$750.00 as soon as possible. The long-standard \$500.00 scholarship no longer covers the basic tuition cost of a freshman medical student (\$605.00 for the Fall-Winter-Spring sequence).

The Scholarship Awards program for 1968 was highlighted by presentation of the University of Minnesota's *Outstanding Achievement Award*. Dr. Harold G. Scheie, (Med. '35), Chairman of Ophthalmology at the Hospital of the University of Pennsylvania, was presented the award by President Malcolm Moos of the University of Minnesota. Dr. Scheie is the 36th graduate of the Medical School to receive the OAA. He has had a long career as a distinguished educator and eye surgeon, including an illustrious record of military service, including World War II.

OPERATIONS

The Minnesota Medical Foundation was chartered in 1939 as a nonprofit, tax-exempt corporation wholly dedicated to the assistance of the University of Minnesota Medical School. Present quarters are at 1342 Mayo Bldg. There are two full time staff members, and two part time employes. Operations of the Foundation are the responsibility of the executive director. Policies are established by a Board of Trustees consisting of 37 current members. Basic costs of operation are met by the accumulated dues payments and gifts provided by more than 2,000 members. In recent years, the Foundation has received approximately one-quarter of a million dollars per year in contributions for medical education at the University of Minnesota.



Harold G. Scheie (Med. '35), center, receives the OUTSTANDING ACHIEVEMENT AWARD from President Malcolm Moos (right), University of Minnesota, and the congratulations of Karl W. Anderson (left), president of the Minnesota Medical Foundation, in ceremonies held September 23, 1968.

Largest single gift ever received was a \$4,000,000 bequest from the estate of Royal A. and Olive Whiting Stone, St. Paul, Minn., which was acquired in 1967-68, and is earmarked for the support of research in heart disease and cancer.

The Minnesota Medical Foundation has decided initially to retain the corpus of the *Stone Memorial Fund* and to utilize only

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its annual earnings for the purposes indicated. For the year which began July 1, 1968, the sum of \$100,000.00 was allocated. Of this amount, \$50,000.00 has been earmarked for establishment of a *Stone Professorship of Cardiovascular Research* in the Department of Pathology, and a *Stone Professorship of Cancer Research* in the Department of Obstetrics and Gynecology. The Foundation has guaranteed 10 years of support for each professorship, after which the burden of support will pass entirely to the University of Minnesota itself.

The remaining \$50,000.00 in allocations for the first year is to support Medical School research, with emphasis on junior faculty members, and on unusual needs of established investigators.

LOAN FUNDS

Five different loan funds are currently managed by the Foundation, offering students a full range of short term notes to long range obligations. Little or no interest is charged, and the loans are available on minimum notice. Among these loan funds are the MEDICLINICS—FLORENCE A. KERKHOF LOAN FUND, SOUTHERN MINNESOTA MEDICAL ASSOCIATION LOAN FUND, HERMAN M. JOHNSON MEMORIAL LOAN FUND, MINNESOTA MEDICAL FOUNDATION EMERGENCY LOAN FUND, and the newly created INTERNS AND RESIDENTS LOAN FUND, which was created by a grant of \$2,000.00 to the Foundation from the Minneapolis Academy of Medicine.

UNIVERSITY OF MINNESOTA MEDICAL BULLETIN

The Foundation is publisher of the University of Minnesota MEDICAL BULLETIN, which is sent monthly to all alumni of the Medical School, to all members of the Foundation, and exchanged with approximately 100 medical libraries around the world, including Moscow and Peking.

Over the years, cost of the MEDICAL BULLETIN has been borne by the Minnesota Medical Foundation, with assistance from University Hospitals. Starting in 1969, the Foundation will assume full fiscal responsibility for publication of the MEDICAL BULLETIN. All editorial work is presently done by employees of the Foundation, except scientific articles, which are written by faculty members. The imposing task of planning, writing, editing, printing, and circulating the MEDICAL BULLETIN ten times each year to about 6,000 readers is a major obligation borne by the Minnesota Medical Foundation.

MINNESOTA MEDICAL FOUNDATION

STATEMENT OF CONDITION*

RESOURCES

	June 30,	
Current Funds	1968	1967
Unrestricted		
Cash-Checking Account	\$ 10,359.04	\$ 11,342.18
Cash-Savings Account and Certificates	49,258.78	28,145.74
Restricted		
Cash-Checking Account	29,833.42	22,904.56
Cash-Savings Account and Certificates	94,487.54	82,018.07
Investment Trust Fund	180,000.00	
Total Current Funds	\$ 363,938.78	144,410.55
Student Loan Funds		
Cash-Checking Accounts	\$ 6,770.71	\$ 3,756.22
Cash-Savings Accounts	2,206.68	2,120.57
Notes Receivable		
Herman M. Johnson Memorial Loan Fund	6,055.00	8,225.00
Minnesota Medical Foundation Emergency Loan Fund	1,440.50	1,650.00
Southern Minnesota Medical Association Loan Fund	13,496.00	11,965.00
Mediclinics Loan Fund	44,150.00	
Total Notes Receivable	\$ 65,141.50	\$ 21,840.00
Total Student Loan Funds	\$ 74,118.89	\$ 27,716.79
Endowment Funds		
Regular		
Cash-Savings Account	\$ 19,109.75	\$ 1,358.19
Investment Trust Fund	4,686,097.59	3,752,599.74
Special		
Cash-Savings Account	2,264.51	1,833.56
Investment in Mutual Funds	4,437.66	1,915.79
Total Endowment Funds	\$4,711,909.51	\$3,757,707.28
Total Resources	\$5,149,967.18	\$3,929,834.62

MINNESOTA MEDICAL FOUNDATION

STATEMENT OF CONDITION*

LIABILITIES AND FUND BALANCE

	June 30,	
	1968	1967
Current Funds		
Executive Office Account with University of Minnesota	\$ 428.88	\$ 5,612.68
Medical Bulletin Subsidy 1967-68	3,000.00	—
Unrestricted Funds	56,188.94	33,875.24
Restricted Funds	304,320.96	104,922.63
Total Current Funds	<u>\$ 363,938.78</u>	<u>\$ 144,410.55</u>
 Student Loan Funds		
Herman M. Johnson Memorial Loan Fund	\$ 9,982.16	\$ 9,996.64
Minnesota Medical Foundation Emergency Loan Fund	3,843.35	3,432.75
Southern Minnesota Medical Association Loan Fund	15,742.57	14,287.40
Mediclinics Loan Fund	44,550.81	—
Total Student Loan Funds	<u>\$ 74,118.89</u>	<u>\$ 27,716.79</u>
 Endowment Funds		
Regular	\$4,705,207.34	\$3,753,957.93
Special	6,702.17	3,749.35
Total Endowment Funds	<u>\$4,711,909.51</u>	<u>\$3,757,707.28</u>
Total Liabilities and Fund Balances	<u>\$5,149,967.18</u>	<u>\$3,929,834.62</u>

* Audited by Main LaFrentz & Co., Certified Public Accountants,
Minneapolis, Minn.

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CONTACT WITH MEDICAL STUDENTS

Working with students, who are the alumni of the future, is considered a prime activity of the Foundation. Thus the Foundation cultivates and nourishes every possible contact with the 655-member Medical School student body. Aside from offering the popular emergency loan service and scholarship aid program, the Foundation has helped establish long term alumni gift programs involving the Classes of 1966, 1967, and 1968. A Directory of Medical Students is now published annually, and special student events such as Freshman Orientation, Graduation Week exercises, and Internship Announcement day are all supported. In these student programs, the Foundation often works hand-in-hand with the Minnesota Medical Alumni Association.

OTHER MAJOR GIFTS

The Minnesota Medical Foundation is pleased to announce a new gift of approximately \$28,000 by Dr. Elizabeth C. Lowry of Minneapolis, received recently. Dr. Lowry's splendid gift is for the endowment of one or more annual scholarships for women medical students.

MidAmerica Mutual Life Insurance Co. of St. Paul, Minn., through its George Feller Foundation, now provides a continuing grant of \$4,000.00 annually for the Scholarship Fund of the Minnesota Medical Foundation. "George Feller Scholarships" are renewable annually for the entire four years of Medical School. There are presently eight students receiving George Feller Scholarships, with the program now running at full level.

"MASTERS OF MEDICINE" PUBLISHED

During the past year, an intensive effort was made to complete publication of the first comprehensive history of the University of Minnesota medical institutions.

The result was the appearance of *MASTERS OF MEDICINE: An Historical Sketch of the College of Medical Sciences, University of Minnesota, 1888-1966*. The author is Dr. J. Arthur Myers (Med. '20), professor emeritus of medicine and public health, who has spent approximately six years compiling this enormously valuable 921-page volume.

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MASTERS OF MEDICINE is for sale in either hardbound cover (\$15.00) or paperbound (\$10.00) from the publisher, Warren H. Green, Inc., 10 South Brentwood Boulevard, St. Louis, Missouri 63105.

The Minnesota Medical Foundation is grateful to Dr. Frank S. McKinney of Minneapolis, Minn., who made a gift of \$20,000.00 for partial subsidization of *MASTERS OF MEDICINE*. The gift was made in memory of his wife, Martha R. McKinney.

The author, Dr. Myers, has personally contributed a sum sufficient to purchase complimentary copies as graduation gifts to the 152 members of the Class of 1968. Dr. McKinney has pledged a similar gift so that graduates of the Class of 1969 can also be presented copies of the book.

The Minnesota Medical Foundation has assisted Dr. Myers during the demanding task of bringing this historical volume into reality.

FINANCIAL SUMMARY

In the year ended June 30, 1968, the Minnesota Medical Foundation received unrestricted income of \$60,014.32, including dues, gifts, service charges, and interest earned.

During this same period, \$32,266.60 was spent on expenses of operation, including salaries, office overhead, printing, and administrative costs. Miscellaneous grants totalling \$5,434.02 were issued from unrestricted funds.

Total gifts received by the Foundation during the past year amounted to \$929,945.16, including \$611,366.21 in further proceeds of the *Stone Memorial Fund*. Grants made from restricted funds during the past year amounted to \$148,998.43. Most of the retained gifts were transferred to the endowment of the Foundation, usually by request of the donor.

At June 30, 1968, the assets of the Minnesota Medical Foundation were \$5,149,967.18, compared to \$3,929,834.62 a year earlier.

It was, indeed, a very good year, and the Foundation is grateful to its many members and friends for their generous support and belief in the work of the organization.

In behalf of the Board of Trustees, we express our sincere thanks.

—Eivind O. Hoff, Jr.
Executive Director

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The Minnesota Medical Foundation congratulates the following medical students, who qualified for Foundation Scholarships for the 1968-69 academic year:

Anderson, Gordon P. '70	Gross, Stuart I. '69	Peterson, Jerome R. '70
Bailey, Richard C. '70	Hanson, David L. '70	Polta, Thomas A. '71
Beck, Charles H. '71	Hanson, Milton C. '70	Quale, James L. '69
Beck, Charles L. '71	Heithoff, Kenneth B. '69	Rafferty, Dwight K. '70
Beck, Richard L. '71	Hoidal, John R. '69	Rafferty, Robert F. '69
Bennett, Forrest C. '70	Horn, Allen L. '71	Reuter, Patricia M. '72
Bjerke, Randal D. '72	Jacobson, Margaret A. '72	Reuter, Nicholas F. '70
Blewett, Berton D. '70	Jacobson, Robert B. '70	Ries, John P. '70
Braze, John R. '70	Julsrud, Paul R. '71	Rockswold, Gordon A. '70
Braun, Donald P. '72	Kallsen, Gene W. '72	Rossini, James D. '71
Bue, David G. '72	Kauffman, Dwight A. '70	Rozycki, Thomas J. '70
Carlson, J. Paul '70	Keller, Ronald W. '70	Schmiesing, Don C. '69
Carter, Darrell L. '70	Kelly, Arlys E. '72	Schultenover, Stephen J. '72
Char, Devron H. '70	Krook, James E. '69	Scobie, Sandra J. '71
Connolly, Donald '71	Landmark, James D. '71	Shimp, William S. '70
Derksen, D. Jon '70	Larkin, Stephen M. '70	Solum, Allan B. '70
Dixon, Suzanne D. '71	Lewis, Darrell V., Jr. '69	Sorenson, Ronald M. '70
Doebler, William C. '69	Lindquist, Wesley L. '69	Spilseth, Paul M. '69
DuCharme, Richard J. '69	Mellema, Burnell J. '72	Sosey, Walter K. '69
Dysart, Noel K., Jr. '70	Miller, James D. '69	Steuier, Robert R. '72
Ebeling, Brian T. '71	Mjos, Peter O. '72	Strom, James C. '70
Ehlen, K. James '70	Mohs, James A. '72	Tandias, James '72
Flood, William L. '70	Molde, Kent D. '70	Truax, Walter D. '71
Frenning, Daniel H. '70	Nelson, Gregory G. '70	Ullrich, Irma H. '69
Gage, John '71	Nothnagel, Monica A. '72	Veits, Harold R. '70
Galvin, Carroll M. '70	O'Connell, Michael J. '69	Vorpahl, Thomas E. '70
Gentry, Jon F. '71	Osborn, Michael '70	Welge, Barry G. '72
Gilchrist, David R. '69	Perschau, Richard A. '69	Zieve, Sandra T. '69
Green, Edward W. '70		

Supported by former holders of Minnesota Medical Foundation Scholarships, the Scholarship Appreciation Fund roster now consists of 55 alumni who have pledged or given for the perpetual endowment of the Scholarship program:

*Yosoff Aelony '65	John G. Mulrooney '65
*Allen M. Anderson '57	Norman A. Nelson '50
Dale L. Anderson '59	Sidney Nerenberg '54
*Gerald J. Anderson '58	John A. Nilsen '57
Lucy Balian Rorke '57	*Karen Olness Torjesen '61
Louis W. Banitt '58	Norman D. Olson '65
Charles I. Benjamin '65	Avrin M. Overbach '66
Ralph W. Bergstrom, Jr. '64	LaVonae Painter '58
Robert S. Brown '64	David G. Piepgras '65
Harley C. Carlson '51	Frederick L. Ramlall '56
Richard E. Carlson '66	Laurence S. Rivkin '62
George M. Crow '57	G. Nicholas Rogentine '62
Leland Fairbanks '57	Jerome J. Scherek '57
Jon O. Flon '66	Lawrence J. Schut '62
*Charles N. Gamble '55	Stanley W. Shapiro '57
M. M. Goldfine '57	David E. Siewert '60
Roland M. Hammer '58	James A. Silver '58
Bernie H. P. Hanson '62	George Skaiff '59
Eugene W. Hanson '56	Barbara H. Subak '55
C. Lee Harris '52	John E. Sutherland '62
*Estate of Creighton Holstad '63	Joseph W. Teynor '53
Mary C. Howell '62	*Omar A. Tveten '55
Vincent R. Hunt '60	Paul W. Vander Kooi '65
James R. Jude '53	*Lowell W. Van De Riet '62
Nancy R. Lund '62	Frank Van de Water '57
Lowell H. Kleven '58	Joseph J. Westermeyer '61
Donald S. Mattson '54	
David W. McQuoid '61	
Gerald G. Mindrum '61	

*Pledge paid in full

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The Minnesota Medical Foundation gratefully acknowledges the assistance of the following supporters of the 1968 Scholarship Fund:

Adams Clinic, Hibbing, Minn.
Alpha Omega Alpha Honor Medical Society
Advance Foundation, Inc.
Dr. and Mrs. Karl W. Anderson
Bayport Foundation
Raymond N. Beim Foundation
F. R. Bigelow Foundation
Dr. Sidney C. Blackmore Memorial Fund
Ruth Cranston
Grace B. Dayton Memorial Endowment
Roger L. Dell Memorial Fund
Executives' Secretaries, Inc., Twin Cities Chapter
Finley and Friday, Inc.
M. Melvin Goldfine, M.D.
Harold Gottlieb
Lisa Brooks Gregory Memorial Fund
Greystone Foundation
S. J. Groves and Sons
Dr. Charles N. Hensel Memorial Endowment Fund
Dr. and Mrs. F. W. Hoffbauer Memorial Fund
Mr. and Mrs. C. E. Howard
Harry A. Johnson Memorial Fund
Margaret H. and James E. Kelley Foundation
G. T. LeClerq, M.D.
George Macpherson Fund
Mankato Clinic, Mankato, Minn.
Samuel Maslon Foundation
Mayo Foundation, Rochester, Minn.
Frank E. McNally
MidAmerica Mutual Life Ins. Co.
(George Feller Foundation)

Minneapolis Foundation
Minneapolis Gas Co.
Minneapolis Society of Internal Medicine
Minnesota Academy of Medicine
Minnesota Mutual Life Ins. Co.
Minnesota Society of Internal Medicine
Modern Medicine Publications Fdn.
Northern States Power Co.
Northwestern Clinic, Crookston, Minn.
Northwestern National Life Ins. Co.
Nu Sigma Nu Medical Foundation
Leonard C. Odell
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Norman E. and Marjorie Roller Fund
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Hy A. Rosenbaum
Rowell Laboratories, Inc.
Edmond R. Ruben Foundation
Dr. Harold G. Scheie
Elmer H. and Margaret J. Smith Endowment Fund
Mrs. John Pillsbury Snyder, Sr.
Charles B. Sweatt
Harold W. Sweatt
Tozer Foundation
Tralarden Foundation
Dr. Percy A. Ward Memorial Fund
Worthington Clinic, Worthington, Minn.
Anonymous
Anonymous
Anonymous
Anonymous



The Glories and Anxieties of Medicine

Wallace D. Armstrong, M.D.
Professor and Head, Department of Biochemistry

FELLOW STUDENTS:

I have been asked to prepare an inspirational message; this puts me considerably out of character since I am a pragmatic man not much given to artistic and spiritual matters.

Nevertheless, I think I know what is expected of me. First, I am to congratulate you; this you richly deserve.

In some respects I must commiserate with you in your tasks over the next four years, and over the next 40 years.

Finally, if I follow the example of others who have greeted the Freshman Class in previous years, I must offer you some avuncular warnings and advice.

Let me say straight away: "Welcome to the medical profession which you join today."

The very fact that you are here demonstrates that your idealism and your desire to serve the roles of a doctor have stimulated you to the exertions required to survive 3-4 years of pre-medical education.

You certainly know how doctors are regarded by those who depend on our knowledge, skills, compassion and sympathy. No one has better described the moral eminence of doctors than **Robert Louis Stevenson**. You will all remember who Robert Louis Stevenson was when I remind you that he was a Scottish-born novelist and poet. He wrote "*Treasure Island*", "*Kidnapped*", "*Dr. Jekyll and Mr. Hyde*", and "*A Child's Garden of Verses*."

An address to the entering Freshman Class, Medical School, University of Minnesota, September 20, 1968



These last verses, I now find, are as well read by grandparents as by children. Do you remember this short one?

*A birdie with a yellow bill
Hopped upon the window sill
Cocked his shining eye and said
"Ain't you 'shamed, you sleepy-head!"*

Stevenson was well acquainted with doctors. He was a life-long semi-invalid born of a tubercular mother. He sought health in the sanatoria of Switzerland and Saranac Lake, New York; in San Francisco, and in Samoa. In the dedication of a book of poetry Stevenson wrote:

"There are men and classes of men that stand above the common herd: the soldier, the sailor, and the shepherd not unfrequently; the artist rarely; rarer still, the clergyman; the physician almost as a rule. He is the flower (Such as it is) of our civilization; and when that stage of man is done with, and only remembered to be marvelled at in history, he will be thought to have shared as little as any in the defects of the period, and most notably exhibited the virtues of the race. Generosity he has, such as is possible to those who practise an art, never to those who drive a trade; discretion, tested by a hundred secrets; tact, tried in a thousand embarrassments; and what are more important, Heracleian cheerfulness and courage. So it is that he brings air and cheer into the sick-room, and often enough, though not so often as he wishes, brings healing."

You are to be congratulated also because you are entering medicine at an exciting and stimulating time. Actually, most periods in medicine can be said to have represented progress and rich expectations for the future. For example, in 1902 the great William Osler wrote a poetic essay of praise of a half-century of medical progress. He said, "*Never has the outlook for the profession been brighter*" and "*The average sum of human suffering has been reduced in a way to make the angels rejoice.*"

Nevertheless, I believe that medicine has never had such prospects as those which face you and which you will develop and use. The scientific advances over the last decade can be said to have been literally stupendous. These are rapidly finding their way into clinical practice, or they point out directions for further investigations of practical utility. For example, in my own field of biochemistry, (and this is only one basic science field) remarkable insights into life-processes have been obtained by demonstrations as to how these processes are initiated, established and regulated by the structure and configuration of molecules. Thus, several

diseases are now known to be a result of small substitutions or alterations in molecules whose molecular weights are well over a million.

ARTIFICIAL LIFE

These developments in biochemical knowledge are such that I now see no theoretical objection to an understanding of the chemical mechanisms of life processes even such as to permit the artificial creation of life. This will surely come in your life-time. In a certain sense it has already occurred through the laboratory multiplication from purified substances of the DNA of a virus which infects the colon bacillus. Now, I hasten to add that I do not expect factory production of babies like that described in Huxley's "*Brave New World*." I feel safe in predicting that this method of producing babies even if it works would never be genuinely popular.

The applications of basic science and clinical investigations has altered the entire complexion of medicine in my professional life-time. When I was a medical student, 30-odd years ago, the wards of this hospital were filled each winter with patients with lobar pneumonia caused by the pneumococcus. These patients struggled to breathe; they were in pain; many died and others were left with severe complications. This disease has now virtually vanished in the wake of the widespread use of penicillin.

VANISHING DISEASE

In those now medically-ancient days every child who developed a cold and tonsillitis was a likely candidate for infection of the middle ear and from this mastoiditis. The latter carried the grave risk of severe illness and death. My friend, Dr. Isidore Snapper, who is a great clinician, historian and philosopher has written: "*If the only advantage of non-scientific, indiscriminate administration of antibiotics has been the eradication of mastoiditis and its dangerous complications humanity has been well served.*"

And so it goes, or nearly goes, with diseases such as tuberculosis, rheumatic fever and many of the diarrheal diseases. The Swiss mountain town, Davos, to which Robert Louis Stevenson went for the treatment of his tuberculosis was, until 10-15 years ago, a collection of sanatoria for the cold-air treatment of T.B. These sanatoria are not now needed, and have been converted into hotels for skiers and into hospitals for the treatment of their broken bones.

We in medicine cannot take all the credit for the decline in incidence of infectious diseases particularly in the instance of those caused by bacteria which affect the intestinal tract. These have

been reduced, or in some cases very nearly eliminated, mainly by engineers who have provided ways to dispose of sewage and to protect food and water from contamination. I suppose it is not too far off the mark to say that the household refrigerator has done as much to reduce infant mortality during this century as any other single modality.

In your own life-time poliomyelitis has been conquered by means of prevention. I would not wish to take anything away from the contributions of Drs. Salk, Sabin and Cox who developed the polio vaccines. However, their work was a direct result and outgrowth of the basic science work of Dr. John Enders, who learned how to propagate viruses in the laboratory.

SURGERY AND DIAGNOSIS

Knowledge, and its application to medicine, is increasing at an almost exponential rate. In the last five years, we have been provided with more effective, and hopefully safer, antibiotics, hormone preparations, diuretics and better immune suppressive drugs. It is these latter drugs which allow surgeons to replace a failing kidney or heart, for example, by transplantation of an organ from another individual. These anti-rejection drugs were developed from basic research in genetics, biochemistry and pharmacology.

Surgeons have long possessed the technical and operational skills, or they could have acquired them, to conduct the long and formidable operations which are now commonplace. I believe that they have always been bold enough. A surgeon is nothing if he is not bold! Nevertheless, these operations could not be successfully undertaken except for the availability of safer anesthetics and of knowledge as to how to use them. Their patients are also supported and maintained through the operations and in the post-operative periods by the applications of studies of biochemists and physiologists who have learned the fundamental aspects of control of water and electrolyte contents of body fluids.

Laboratory tests which were not even developed five years ago are now routinely applied to the study of patients, frequently by use of automated equipment. These laboratory studies, and the applications of radioisotopes, furnish diagnostic tools which amount very nearly to an autopsy *in vivo* of the patient. Obviously, these more precise and rapid aids to diagnosis allow the physician to be more rational and correct in his treatment.

Although some diseases have been eliminated, and others nearly so, you can be assured that you will have more than enough to do. You will be faced with an increasing impact of the metabolic diseases and those that are genetically determined. The problems of cardio-vascular disease and cancer are far from solved.

Until someone develops a safe automobile or a safe driver, you will have to deal with an increasing problem of the effects of trauma and of rehabilitation of accident victims. While the nutritional deficiency diseases are now uncommon in our affluent society, I think it not unlikely that some of the diseases due to dietary insufficiency may recur in the ghetto children in our cities.

MORE SCIENTIFIC AND IMPERSONAL

As medicine becomes more scientific, and I am afraid, more impersonal, your generation of doctors must realize the consequent moral and ethical hazards to you and your patients in patient-doctor relationships. Doctors, far more than the members of any other profession, have the opportunity for undetected chicanery and fraud which may not even be realized by the doctor himself. A doctor does not have to be consciously and deliberately corrupt to cheat his patients. Most such instances, I believe, derive from carelessness, ignorance, laziness and boredom.

Sympathy, compassion and personal interest are still very essential parts of a doctor's role in patient care. I hope the time never comes when medicine becomes so objective and so structured that these attributes of a doctor are discarded. These and skillfull patient care can be kept alive only by maintaining your determination to do what is right and good. Thus, I beseech you, in the words of an illustrious American:

"Labour to keep alive in your breast that little spark of celestial fire-conscience."

GEORGE WASHINGTON (COPY-BOOK)

You will still be at the heights of your power well into the next century. It will be your task, during the next four years, to begin your preparation for medicine of the 21st century. We who are to be your teachers can see the paths of medicine of the future only dimly. Thus, you have the responsibility to develop your knowledge and attitudes of mind so that you can grow into the kind of medicine which will be far different from anything we now know or can now envisage.

Most of you will find your careers in service to sick people, and this is as it should be. A number of you, I hope, will become teachers and medical investigators in the basic science and clinical fields. It is not too much to expect that one of you will be a Nobel Laureate.

Some of you will become medical administrators. It is almost certain that I am looking at a future dean. In fact, from the present rate of proliferation of deans, it is not unlikely that several of you will become deans.

Thank you, and good luck!

Biochemistry

Evolution of Creatine-Synthesizing Enzymes in the Animal Kingdom

John F. Van Pilsum, Ph.D.†

DISTRIBUTION of the creatine-synthesizing enzymes in the animal kingdom is believed to have phylogenetic significance. There is a basic split in the Chordates which separates the lamprey and higher vertebrates from the hagfish and primitive Chordates at the point where the creatine-synthesizing enzymes have evolved.



J. F. Van Pilsum

It has been believed since 1930 that the presence of creatine in the animal kingdom had phylogenetic significance. The basis for this was that creatine phosphate was found in vertebrate muscle while arginine phosphate or other phosphorylated guanidines were found in invertebrate muscle. These phosphorylated guanidine compounds are called phosphagens and are believed to act as stores of phosphate bond energy for converting adenosine diphosphate to adenosine triphosphate. Later, other investigators found that creatine was not restricted to vertebrates, but was found in sea urchins, sponges, and jelly fish. Therefore, the phylogenetic significance of creatine in animals was questioned by many investigators.

Newer, more specific methods of analysis for creatine were available so it was decided to reinvestigate the problem. In addition to screening for the presence of creatine in animals, the presence of creatine synthesizing enzymes was also determined. Two enzymes are involved in creatine synthesis in mammals: transamidinase catalyzes the transfer of the amidine group from arginine to the amino group of glycine to form guanidinoacetic acid (GA); the methylation of GA to form creatine is catalyzed by the enzyme GA methylpherase.

Tissues from animals representing five classes of vertebrates; dogfish, frog, mud turtle, chicken, rat, and man were found to have creatine and the creatine synthesizing enzymes. Tissues from animals representing eight phyla of invertebrates were analyzed. Creatine was found in certain marine annelids, Echinoderms (sea

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urchins) and in some primitive forms of Chordates. However, the creatine synthesizing enzymes were not found in these creatine containing invertebrates. All of these invertebrates were found to have the ability to abstract creatine from their environment—sea water. Therefore, the presence of creatine in the Echinoderms certainly should not be used as a biochemical argument in favor of their attachment to the transition classes between vertebrates and invertebrates.

It was believed that the presence of creatine-synthesizing enzymes in a phylum might indicate a transition between vertebrates and invertebrates. A survey was made of the amphioxus (a Cephalochordate) and the hagfish and lamprey (both Cyclostomes). All animals had large amounts of creatine in their tissues, yet only the lamprey had the creatine-synthesizing enzymes. Both amphioxus and the hagfish had the ability to abstract creatine from sea water; the lamprey lacked this capacity. These findings are believed to have phylogenetic significance. There are currently two opinions with respect to the phylogeny of the roundmouth eels or cyclostomes. One view is based on the reconstructions of fossils from Spitzbergen by Stensio. He believes that the hagfish and lamprey are derived from two separate lines of descent, and that the divergence occurred 600 million years ago. Kiaer believes the lamprey and hagfish had only one line of descent with the divergence of the two a relatively recent event—about 100 million years ago.

Because the hagfish resembles the amphioxus, a Cephalochordate, and the sea squirt, a Urochordate (or tunicate) with respect to its lack of creatine-synthesizing enzymes and with respect to the ability to abstract creatine from sea water, these data are offered as support for the theory that postulates an early separation of the hagfish from the lamprey. The lamprey more resembles the jawed fish as far as creatine-synthesizing enzymes are concerned. At least our data may be interpreted to indicate that the Cyclostomes should be reclassified. At present they are both listed in one class of jawless vertebrates.

The last phase of the project involved obtaining data on additional vertebrates. The cartilaginous fishes, i.e. sharks and rays, were investigated. The results were similar to those obtained with a salamander and a snapping turtle. All animals had large amounts of creatine in their muscle, all lacked creatine-synthesizing enzymes, and all lacked the ability to abstract creatine from water. The snapping turtle was not tested for this ability. Recoveries of both creatine-synthesizing enzymes added to the tissues of the sharks, rays, and snapping turtle were poor. This apparent dilemma has been resolved in our minds as follows: All of these vertebrates are carnivorous. The ray is a bottom feeder and probably

consumes particles of fish left over from the sharks, etc. In 1960 Walker, and Fitch, *et al* reported that tissues from rats fed diets supplemented with creatine has only a small fraction of transaminidase activity as those found in rats fed a creatine-free diet. Under these experimental conditions of a one-week feeding period guanidinoacetic acid methylpherase did not disappear. However, it seems possible that animals with a constant source of creatine in their diet may have adapted to their environment and lost both creatine-synthesizing enzymes or may have developed inhibitors to the enzymes. The data obtained from the sharks, rays and snapping turtles indicate an inhibitor has developed. It is of interest to us that man, for example, has thus far retained the ability to synthesize creatine in spite of the fact that, by and large, he has a source of creatine in his diet. This may be the reason that man can be a vegetarian.

As a result of our investigations it has been concluded that proper interpretation of biochemical aspects of phylogeny is possible only if three factors are considered with respect to the organism under investigation: 1) the presence or absence of the compound in the tissue, 2) the presence or absence of the enzymes necessary for its synthesis, and 3) the availability of the compound to the organism from its environment.

† Associate Professor, Department of Biochemistry

Social Service

Social Work in Pediatric Neurology Clinic*

Margaret O. Stevens, M.S.W.†

Kenneth F. Swaiman, M.D.‡

Francis S. Wright, M.D.§

PATIENTS seen in the University of Minnesota's Pediatric Neurology Clinic present a wide variety of neurological problems ranging from acute, short-lived difficulties to severe, chronic life-shaping disabilities. The latter group of patients frequently have illnesses of long duration and although ameliorated by medical care still pose many practical problems. Many of these patients suffer from seizures, learning disabilities, and motor and intellectual retardation.

From a report to the Staff Meeting of University Hospitals, Spring, 1968

† Senior Social Worker, University Hospitals.

‡ Associate Professor, Departments of Pediatrics.

§ Assistant Professor, Division of Neurology.

It is difficult for any physician to manage such problems without the aid of other disciplines. Successful treatment of the patient is not possible unless there is adequate adjustment in the child's home, school and social environment.

The services of social workers have been increasingly valuable through the years in helping us to evaluate the child, his family and his school for purposes of diagnosis and therapy. Our social workers have also given counsel and support to the families, schools and outside agencies. This approach to problems has been more satisfying to our patients, their families and to the Social Service staff of the University Hospitals.

ROLE OF THE SOCIAL WORKER

Severe social problems are found frequently in children with neurological disabilities. Resulting behavioral disturbances may increase the child's environmental difficulties and induce in others an unfavorable attitude toward him. Parents may react to the child's behavior with feelings of frustration, despair, inadequacy, and humiliation. Readjustment of many traditional parental attitudes and expectations is essential and this can be achieved by acknowledging the problem, identifying it, and planning a therapeutic program.

How do the functions of the social workers in the pediatric neurology clinic relate to the medical diagnosis, treatment, and long-range planning for the patient?

Diagnosis:

The social worker interviews the parents for information concerning the parents' background, education, attitudes, feelings, actions, and strengths to assess the family further. She gathers information from the school to assess the child's adjustment, social and academic, to the reality situation of school. She collects information from agencies to further assess the family, their methods of handling difficulties, and their attitudes toward the child. This comprehensive assessment is of value to the physician if he is to help the patient, the family, and the teacher to understand the patient's difficulties.

Treatment:

The social worker counsels the parents to explore more adequate ways in which the parents and the child might enjoy a more satisfying relationship. Professional help for the child also includes help for the parents, because it removes many of their misgivings and enables them to respond appropriately to the child's needs. She explores with parents their readiness for counseling and utilization of community resources and assists in preparing them to accept these services. Some families need more intensive, long-term counseling for problems which may or may

not be related to the medical problem. Such families are referred to appropriate social agencies or mental health clinics in the patient's community. She refers parents to a county welfare department when appropriate for counseling, assistance with placement plans for the child, and for financial assistance.

A knowledge of community and school resources available to the child and his family is an important part of the treatment approach. If no appropriate resource is available, the social worker works in cooperation with agencies to establish such a resource. Last year the pediatric neurology social worker, with the cooperation of the *Minneapolis Association for Retarded Children*, helped to establish a group therapy program for teenage girls with seizure disorders.

Long-range planning:

The social worker maintains contact with families through regular or periodic interviews to assess the child's progress. She maintains contact with schools and agencies involved with the child and his family for their assessment of the child's progress. She arranges and participates in conferences with school staffs. She coordinates information between families, agencies, schools, and the physician for the benefit of the patient. It is the physician who is responsible for the ultimate care and treatment of the patient. The role of the social workers is to assist the physician to attain the maximum benefit of treatment for the patient.

Pediatrics

The Pathogenesis of Rheumatic Fever

Elia M. Ayoub, M.D.*

GROUP A streptococcal infection has been established as the precipitating factor in the occurrence of rheumatic fever. The mechanism by which infection by this organism leads to the pathological reactions that characterize rheumatic fever is still not resolved.

Some aspects of the disease suggest that a hypersensitivity reaction is involved in the pathogenetic process. The occurrence of a latent period between the acute streptococcal infection and the onset of the acute rheumatic manifestation, the inability under strict aseptic techniques to isolate the streptococcal



From a report to the University Hospitals Medical Staff on October 4, 1968

organism from the tissues of the affected individuals, and the similarity of some of the symptoms of rheumatic fever to those of serum sickness, have all underscored the hypersensitivity hypothesis. The factor of "individual susceptibility" has been supported by the fact that reinfection with group A streptococci in a rheumatic population will lead to recurrence of the disease at a much higher rate than that encountered in the general population.

The "immunological hyper-reactivity" of rheumatic individuals has been entertained as an explanation for susceptibility to this disease. While this hyperreactivity was suggested by the finding of strikingly elevated antibody levels to some streptococcal products, various studies where the immune response of rheumatic individuals was evaluated by immunization with a variety of bacterial and nonbacterial antigens has yielded conflicting results.

More recent work has advanced the concept of "auto-immunity" as a possible factor in the pathogenesis of this disease. This view has been supported by the finding of antigens common to the group A streptococcal cell and both cardiac and joint tissues. Deposits of gamma globulin have been found in the cardiac tissue from patients with rheumatic carditis and circulating antibodies to heart tissues were detected in these patients. However, similar antibodies were found in the serum of patients with uncomplicated streptococcal infection and patients with rheumatic fever but without carditis.

Current studies in our laboratory have revealed the occurrence of a specific immunological phenomenon in patients with rheumatic valvular heart disease. An investigation of the levels of the antibody to the group A polysaccharide in patients with various sequelae of group A streptococcal infection showed that high levels of this antibody are present in the sera of most of these patients during the acute stage of these illnesses. The levels of this antibody decline to normal limits within six months from the onset of the illness in most patients *except* in those with rheumatic valvular heart disease in whom elevated levels for this antibody persist for up to 25 years. This finding was in contrast to the pattern of antibodies for other streptococcal antigens, the ASO and anti-DNase B, which declined to normal levels within six months in all the patients studied. The prolonged persistence of the antibody to the group A streptococcal carbohydrate in patients with rheumatic valvular heart disease is of particular interest in view of the known cross-reactivity of this streptococcal antigen with antibody to a glycoprotein antigen of cardiac valvular tissue.

The persistence of the group A antibody in patients with rheumatic valvular disease can probably be accounted for by prolonged antigenic stimulation. Such a stimulus could be due to persistence

of the streptococcal polysaccharide antigen in the host's tissue or to release of the cross-reactive glycoprotein antigen from the damaged valve. The former possibility is being investigated by studying the intracellular degradation of the streptococcal antigen in phagocytic cells of normal and rheumatic individuals, the objective being to determine whether the individual with rheumatic valvular disease might be deficient in his capacity for degrading the polysaccharide antigen. Such a deficiency could be related to an abnormality in the intraphagocytic enzyme, beta-N-acetylglucosaminidase, which is responsible for degrading the streptococcal group A polysaccharide by the phagocytic cells. The second possibility was tested by assaying antibody levels to the group A polysaccharide in patients with acquired non-rheumatic valvular heart disease and in patients with congenital valvular heart disease. The results indicate that in patients with non-rheumatic valvular heart disease, who show no evidence of recent streptococcal infection, the antibody levels to the streptococcal group A antigen are in the normal range.

It is difficult to conclude whether the presence of this peculiar immunological phenomenon in patients with rheumatic valvular heart disease is involved in the pathogenesis or is an outcome of the disease. However, the specificity of this finding should offer a possible approach to further exploration of this problem.

* Associate Professor, Department of Pediatrics.

CORRECTIONS TO FACULTY REGISTRY, 1968-69

(Amending pp. 17-34, September issue)

PEDIATRICS, Department of

Clinical Professor Emeritus
Hyman S. Lippman

Assistant Professor
John Matsen

*Clinical Assistant
Professor Emeritus*
Robert Rosenthal

Clinical Instructor
Richard C. Cohan
Robert T. Dooley
Sergio Franco-Vasquez

CHILD PSYCHIATRY, Division of

Assistant Professor
George J. Barry
Michael Koch
James Lawton, Jr.
Lawrence Mayerle

NUCLEAR MEDICINE, Division of

Clinical Assistant Professor
Elmer Paulson

Instructor
John M. Wolff

Clinical Instructor
William A. Wilcox

GENERAL SURGERY, Division of

Clinical Assistant Professor
Lyle V. Kragh

Medical School

EUGENE GRIM NEW HEAD OF PHYSIOLOGY

Dr. Eugene Grim, professor of physiology, has been appointed chairman of the Department of Physiology. He succeeds *Dr. Maurice B. Visscher*, who relinquished the headship after 32 years.

Dr. Grim, 45 years old, received the Ph.D in physiological chemistry from the University in 1950. He joined the faculty in 1951, and has done his major research in the areas of membrane transport phenomena, and gastrointestinal physiology (circulation and absorption).

In addition to advising and teaching physiology graduate students and medical students, he is responsible for the general operation of all physiology undergraduate courses for dentistry, medical technology, pharmacy, PT, and the College of Liberal Arts.

Dr. Visscher is spending his final year at the University in teaching and research. He is a University of Minnesota Regents' Professor and Distinguished Service Awardee of the Minnesota Medical Foundation.

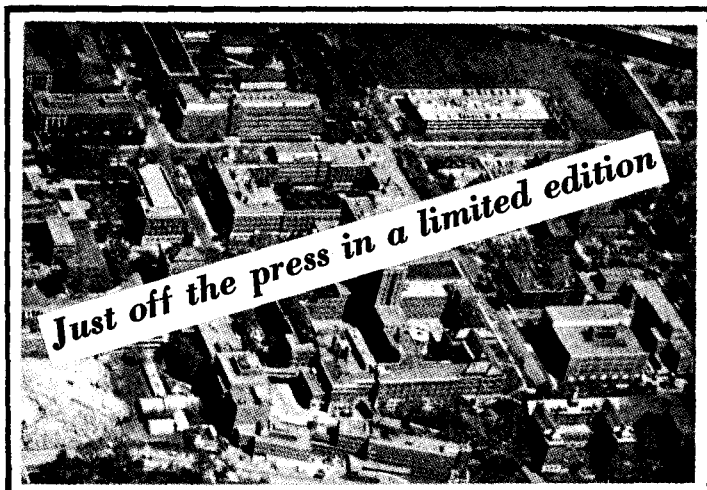
REGENTS' PROFESSORS

Dr. *Cecil J. Watson* was awarded the title of *Regents' Professor of Medicine* and Dr. *Paul E. Meehl* the title of *Regents Professor of Psychology* by the University of Minnesota at ceremonies opening the Fall term. It is the University's highest recognition for faculty members, and consists of a silver medallion hung from a maroon and gold ribbon, and cash prize of \$5,000.00 per year.

Dr. Watson is a world authority on liver disease and internal medicine. He is currently head of a University teaching unit in Medicine at Northwestern Hospital, Minneapolis, and was head of Medicine at Minnesota from 1936 to 1966.

Dr. Meehl, a 1941 summa cum laude graduate of the University, received the Ph.D. in psychology at Minnesota in 1945. He was chairman of the psychology department from 1951 to 1957, and president of the American Psychological Association in 1962-63.

Dr. Meehl is nationally recognized for his work in personality theory, measurement theory, and clinical theory.



MASTERS OF MEDICINE

An Historical Sketch of the College of Medical Sciences
University of Minnesota 1888 - 1966



By

J. ARTHUR MYERS, M.D.

*Professor Emeritus
School of Public Health and
Department of Internal Medicine
Medical and Graduate Schools
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Alumni Deaths

Harriet D. James/1934

Died August 24, 1968, in Boston, Mass. following a long illness. Native of Two Harbors, Minn. and former pharmacist there: staff member of Lahey Clinic, Boston, and certified dermatologist. A library and clinic wing will be named in her honor.

Waldemar G. Johanson, Sr./1930

Died June 17, 1968, age 62 years. Family physician in the Payne Ave. area of Eastside St. Paul, Minn. for 36 years. Survivors, wife, Violet, two daughters, one son, Waldemar G. Johanson, Jr. (Med. '62), all of St. Paul.

Arthur A. H. Koepsell/1932

Died July 3, 1968, age 63 years, in Sacramento, Calif., where he practiced OB-GYN. Veteran of World War II. Death caused by rheumatic heart disease.

George F. Malin/1931

Died April 22, 1968 of cancer at age 64 years. Practicing urologist in LaCrosse, Wis.

Jack Gordon Olsen/1947

Died of cancer May 14, 1968, age 43 years. Urologist in Santa Monica, Calif.

Harold G. Reineke/1922

Died May 16, 1968, age 71, of cancer in Cincinnati, O. Radiologist; past president, American Roentgen Ray Society; served on faculty of University of Cincinnati College of Medicine.

Gordon C. Tornberg/1939

Died May 26, 1968, age 55 years, of heart disease and complications. Lived in Cadillac, Mich.

MEMORIALS

Herman A. Anderson

Edward F. Bronce

Charles D. Gallaher

Gertrude M. Gilman

Hannah Hagen

Charles O. Jenks

Mrs. Norma Kindy

Dr. Lawrence J. Leonard

Dr. Ralph Platou

Ruth C. Smith

Elmer Stewart

Ell Torrance

Carrie Van Den Einde

Dr. Francis M. Walsh

Barbara H. Wright

Grace E. Yale



ALUMNI SCENE

Alumnus John Amberg ('49), San Francisco, Calif., offers these thoughts on the depth of alumni support as discussed here last month:

"... There is little doubt in my mind that the affection for the Medical School in my class was very low. We were not impressed that a significant portion of the faculty was at all interested in undergraduate medical education. Student harassment seemed at about the same immature level as practiced by the Armed Forces. I am sure that if we were not such a frightened, docile, disciplined group and if we had known of today's modes of protest, we would have erupted. Obviously the situation has been partially corrected. My discussions with recent graduates indicate a marked improvement in attitude.

"When it comes to alumni loyalty, I think the final or definite training that the resident or intern gets often leaves him with a warm feeling for that institution. I feel that the Resident-Intern group should be formally added to the alumni group. My own warmth for the Medical School only exists because of my residency experience."

TAX TIP

Gift to the Foundation this year will "cost" less than it did in 1967, and possibly less than in 1969. This is because of the income tax surcharge. The higher a donor's tax bracket, the lower his after-tax cost of charitable gifts.

Married alumnus with \$20,000 taxable income can donate \$100.00 this year at actual cost of only \$69.90. Last year: \$72.00. Watch those bargains!

Sincerely,

Eivind Hoff, Jr.
Executive Director

EH:ev

Comments and criticisms of remarks appearing in this column are welcome. Indeed, they are solicited. Communication between Alma Mater and the Alumni Family must be two-way. Let us hear from you.

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