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ON THE COVER:
Computers have become an important part of modern medicine. Shown on the cover is an example of a long-standing computer system in use at the Medical Center. See story on page one.

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Computers assist in research, patient care

By Glenda King Rosenthal

During the past decade, computers have become an integral part of medicine, both in research and patient care. Physicians and biologists both depend on computers to aid them with difficult biomedical challenges. The Biomedical Computer Laboratory (BCL) at the School of Medicine, along with the Computer Systems Laboratory and components in the Departments of Electrical Engineering and Computer Science, comprise the University's Resource for Biomedical Computing which recently received a $5.77 million grant from the Division of Research Resources of the NIH. Through this and other support, the Resource has contributed to the application of computers in biology and medicine.

As modern science has continued to advance, the volume of scientific data has become overwhelming. In recent years a tool to assist the scientist in research has been the computer. In seconds a computer can determine answers which would take a researcher days, making analysis which otherwise would remain hidden.

The Biomedical Computer Laboratory (BCL) was established at the School of Medicine in 1964 for the advancement of biomedical science through the application of computers to problems in medicine and biology.

Today computers are being used effectively, not only in research but also in the delivery of patient care. More than 100 mini-computer systems are in operation at the School of Medicine in 15 departments and divisions.

When the BCL was organized the conventional approach was to bring the research project to a large computer, says Lewis J. Thomas, Jr., M.D., associate professor and director of the BCL.

The feelings of Jerome R. Cox, Jr., Sc.D., who founded the BCL was that the machine should be taken to the problem, Thomas says. "This was the whole philosophy behind the design of the LINC (Laboratory Instrument Computer) which was introduced in 1963."

According to Thomas, the LINC formed the basis for the use of mini-computers in biology and medicine. The technological accomplishment of meshing the dynamics of a large computer into a small one provided the foundation for the use of minicomputers in biology and medicine.

"Before the LINC the conventional wisdom in the field of computers was that it was the big machine which had the power to solve significant problems," Thomas says. "It was a maverick notion that these little computers could be useful. But the idea did pay off rather well, and the manufacturers of the large machines are now making small ones."

According to Thomas, it is important for a computer to be adaptable to individual research laboratories, serving one investigator in one laboratory. "The LINC was the first real attempt at designing a general purpose computer for use in the laboratory. Previously the investigator had to take his problem to a large computer located some distance from his laboratory," Thomas says.

"During the past 14 years the move has not only been toward the small computers, but to the microprocessors which are even smaller than the mini-computer," he says.

These microprocessors can be located in a laboratory or at a patient's bedside. "One of the advantages of this type of computer," he says, "is that you don't have to wait for the machine. If the researcher has a problem that requires fast processing, he can accomplish it with his own local computer. He can have the computer accept information and operate on it as the experiment is in progress."

Thomas says this type of personal computer allows the researcher to have immediate feedback. "The machine is essentially a research tool that receives data and can interact with the environment and the researcher as well. He can interact with the machine and make it do what he wants when he wants," he explains.

What makes the small computer approach feasible is the significantly lower cost of these mini-computers compared to the larger systems. It's no longer necessary to have the machines doing something all of the time simply to justify their existence.

"We are doing things with the microprocessors we used to do with mini-computers," Thomas says. "The capabilities, memory size and power of the mini-computers are now up to what we used to call midi-computers which are fairly large machines. A microprocessor is not much larger than a small tape recorder."

"However, some problems are still best handled by the larger machines. Sensible use dictates matching the technology to the problem."
Some of the early work with the small computer systems was done in the Barnes Hospital Cardiac Care Unit (CCU). Installed in a special room were two minicomputers which processed and monitored the electrocardiograms of patients in the CCU. "We can now do the same task with a microprocessor system that can be picked up and carried to whatever bedside we want," Thomas says.

The small size and low cost of microprocessors mean that instead of having one computer doing the entire job, we can distribute separate subtasks among multiple microprocessors. They can then be interconnected in interesting ways to make more flexible systems," he says.

The minicomputers first used in the CCU and also in the radiation treatment clinic, were originally designed at the BCI. "The mini-computer used in a radiation treatment planning project was designed here as a derivative of the LINC computer," Thomas says. "The computer was applied clinically and developed well enough to suit local needs. Eventually a national program was established whereby a number of systems were replicated and tested at other institutions. After much feedback and many improvements, this system and derivatives of it are in use all over the world."

Thomas says the study of sudden death done at Jewish Hospital under the direction of G. Charles Oliver, M.D., professor of medicine, is a good example of a research project which has many different needs and uses computers in different ways. The purpose of the project is to study the natural history of sudden death. "The evidence is overwhelming that patients who are thought to be at high risk of sudden death have cardiac rhythm abnormalities," Thomas says. "They have an abnormal rhythm which abruptly interrupts cardiac function and they die quite suddenly."

By studying these patients and establishing which ones have rhythm abnormalities, researchers can identify those who are at high risk of having sudden death and treat them more effectively.

"We collect information from the patients who have entered the CCU at Barnes and Jewish Hospital," Thomas says, "and enter that information on one kind of computer system. We also have those patients wear tape recorders that run for 24 hours and record the patient's electrocardiogram. The recorded electrocardiogram is brought to us and processed on another kind of computer system to get the details of the kinds of abnormal rhythms the patient is having," Thomas explains.

The processing of the electrocardiograms of the patients in the CCU led to a system called ARGUS, which stands for ARrhythmia GUard System. The name is
Left: A wire wrap construction for a project; Below: A basic computer terminal used for the neonatology database; Bottom: H. Dieter Ambos, research assistant.
fitting since Argus was the Greek god who had 1,000 eyes and never slept.

"We have had several major accomplishments during the past 14 years," Thomas says, "but in terms of systems that have been successful and widely used elsewhere, ARGUS and its derivatives provide a good example." According to Thomas, ARGUS was the result of a fruitful collaboration between various disciplines.

"The name of the game is collaboration," he says. "The people in the BCL who are engineers, mathematicians and computer scientists need to learn enough about the biological problems so they can understand the relevance of what they are doing and make contributions to the solutions.

"And biologists, if it is going to be an honest collaboration, have to have a knowledge of the technical issues involved. They should know what questions are sensible to ask and what are sensible approaches to those questions. There has to be continual interactions between the two groups. Without all of these ingredients, most collaborations will not yield anything very useful," Thomas says.

In order to encourage this interaction between the investigator and the BCL researchers are encouraged to take courses offered at the Biomedical Computer Laboratory.

Thomas stresses it is important for investigators to understand what computers can and cannot do for their research. Consequently, the BCL offers courses to the faculty on a regular basis.

"We offer several different courses and will run several sessions of the same course if there is enough interest," he says. "There is a broad survey course geared to the neophyte who might have a use for computers but needs to learn more about them in a general way. This is a good way for us to introduce the use of computers to a prospective collaborator.

"We also spend a lot of time in this course attempting to remove the mystique of computers. We want the investigator to view the computer as a friendly tool rather than an ominous adversary."

"In the early days of the BCL," he says, "it was an uphill struggle to convince
biologists there was something in the world of digital computing which was useful to them."

However, successful programs such as ARGUS and those in radiation treatment planning helped to convince skeptics of the computer's usefulness. The BCL now collaborates with investigators from all over the country as well as at the School of Medicine in more than 100 projects.

"There is a large variety of makes and models of computers in use at the School of Medicine," Thomas says. "There are many, many personal computers in use in the laboratory and at the bedside."

"The BCL grew rapidly in the first decade or so of its existence so that our facilities are now among the more extensive in the country. Our long-term support from the Division of Research Resources has been the major reason why this facility has grown so large and has been successful. But it also has taken us a long time to develop the type of rapport we have with the medical community."

The computer has become a standard tool in medical research and in managing data. "Computers can be of tremendous assistance in gathering data and in the management of a large department," Thomas says. "We developed a data management system for the Glaucoma Center which handles masses of data on their patients. This is extremely useful for their research because, for example, they can get a list of patients who have a particular combination of symptoms or conditions. The computer can search through massive volumes of information and give them a quick answer. The Department of Radiology also utilizes several such systems," he says.

Applying computers to patient care has also become extensive.

"In all areas in which computers are used, but especially in the area of patient care, it is important to remember that computers themselves have no judgement," Thomas says. "They work with basic "yes" and "no" questions but do so more rapidly and reliably than do human beings. The computer will do exactly what you tell it to do, which may not be what you want it to do. Obviously you have to be very careful what you tell the computer to do, especially when it comes to caring for patients."

However, Thomas says, the area of patient care has great potential for computer use. The computer can receive data from a patient, follow treatment instruc-

Above: Computers are often used to aid in experimental surgery; Below: Stephen J. Potter, technical assistant.
tions and provide determinations of what course of action to take.

"The computer can watch what is going on with the patient and participate actively in the treatment," he says. In most situations, the limitations for computer use in patient care come in knowing what to program the computer to do for all the conditions it might encounter.

"In attempting to get the computer to perform a function in patient care, physicians have to go through a very rigorous thinking process to determine the ground rules. This forces them to determine exactly what should be done for the patient under different circumstances. Whether a person or a computer ends up doing it may not be so important. The important thing is that a carefully detailed treatment plan has been developed and agreed upon. The process of applying computers can

stimulate studies which uncover the basic physiologic mechanisms operative in a particular situation," Thomas says.

In many situations the computer can do things that would be impossible for a person. "There is no way a nurse or physician could sit and analyze every heart beat of every patient. The computer can monitor multiple patients and analyze every pulse and heart beat. It's just not possible for a person to gather that type of information, and yet such beat-by-beat statistics are important in guiding the therapy of some patients," Thomas says.

Computers have become an integral part of modern medicine, both in research and clinical areas. They have grown well beyond the experimental stage, and yet they should not be viewed as having extraordinary powers. "For people to believe computers have mysterious abilities is as unrealistic as believing their physicians possess magical curative powers," he says. "It's important to maintain a healthy skepticism."

Thomas emphasizes the importance of having justifiable reasons to use sophisticated computers. "Just because a problem is interesting from a technical point of view does not automatically justify the use of a computer," Thomas says.

"At the Biomedical Computer Laboratory we emphasize not only matching the technology to the problem, but also finding the most expeditious methods for sensibly applying computers in the biological realm."
Described by her colleagues and friends as being warm, brilliant, inquisitive and patient, Virginia Minnich has overcome immense obstacles to become outstanding in the field of hematology.

Over her desk hang pictures of those who have been most influential in her life. "They're the people who have really made my career," she says. Others, however, say it is Virginia Minnich and her determination and abilities which have made her successful.

Virginia Minnich, B.Sc., M.S., D.Sc. (honorary), professor of medicine, is the only person at the School of Medicine to have a professorship without an M.D. or Ph.D. degree.

Minnich came to WUMS as a technician in 1938 with Carl V. Moore, M.D., who was then establishing the Division of Hematology.

She had met Moore as a senior home economics student at Ohio State University. At that time, she worked in his lab studying the monthly fluctuations of serum iron in women. Later she decided to take a nutrition fellowship at Iowa State College. Upon completion of the M.S. degree in nutrition, she asked Moore for a job and was offered one at WUMS.

"I became really interested in science in Dr. Moore's lab," Minnich says. "I liked Dr. Moore and I liked hematology and decided to stay in the field."

Career decisions had not always been so easy for Minnich. Born to a farm family in southern Ohio, she was the third of six children. At the age of four her dress caught on fire from a gas stove used for heat. She suffered third degree burns from her waist up and was left severely disfigured.

"My accident was a big influence on my life," Minnich says. "It made me more determined and stubborn because I was always being told I couldn't do things because of the disfigurement."

At one time a college president told her father she was definitely not college material.

"My family was very sympathetic, but they didn't give me any special favors. They knew I'd have to support myself and they nourished my ambition to go to college although they didn't have the money to help me."

In 1923, at the age of 13, Minnich came to Barnes Hospital for plastic surgery. The family had heard about Vilary Papin Blair, M.D., a well-known plastic surgeon who was chief consultant of maxillo-facial surgery for the American Expeditionary Forces during World War I.

Following her accident in 1913, Minnich had had three reconstructive surgeries in Columbus, Ohio. But these were only a beginning. "Dr. Blair told my family he could do everything in four operations, but those didn't accomplish nearly enough," Minnich says. In the next 30 years she had more than 20 operations.

"While I was seeing Dr. Blair, I had decided to go into nursing," Minnich says. "But he advised me against nursing because of the over-supply of nurses at that time. Of course, I took this personally and believed I was discouraged from nursing because of my appearance."

After high school the money was not available for college. "I stayed home and sewed for my family," she remembers. "I had a beautiful flower garden which I worked in and that is the only thing which kept me sane."

"I had despaired of ever attending college when my sister, who was teaching, loaned me money to get started."

Finally studying dietetics at Ohio State University, Minnich experienced more discouragement, this time concerning being a dietitian. "They said I would have to meet too many people and my appearance would disconcert them."

"So I was advised to take all my electives in chemistry and physics and go into research where I wouldn't have to meet many people."

"My accident had created a real challenge for me," Minnich says. "Since I was continually discouraged, I was determined to prove to myself and everyone else that I could be good at something."

Minnich started college during the depression in 1932. "My sisters helped me as much as they could," she says. "In addition, I did house cleaning, babysitting,
typing and various odd jobs to meet my expenses.

"I seriously considered going to medical school. I really wanted to, but friends discouraged it and the time and money didn't seem to be there."

The lack of an M.D. behind her name did not stop Virginia Minnich from making meaningful contributions to science.

"She has been an inspiration to all of us," says Edward Reinhard, M.D., professor of medicine, colleague and former student of Virginia Minnich's. "She has proven what a tremendous scientific achievement a person can attain without a M.D. or Ph.D. degree."

"She is a very unique person," says Elmer Brown, professor of medicine and former head of the Division of Hematology. "She's not afraid to tackle anything."

One of Minnich's more unique activities through the years has been setting up hematology labs in foreign countries. She helped set up a lab in Havana in 1945.

In 1947, Minnich was selected by the Group Action Council of Metropolitan St. Louis as a "Woman of Achievement."

Minnich went to Bangkok, Thailand, in 1951 on an exchange program. There she established a hematology lab nearly from scratch. "I got discouraged because there wasn't much to work with in the way of equipment," Minnich recalls. "Their technology was much behind ours. But just when things looked hopeless, everything began to fall into place and I stayed a year."

It was while Minnich was working in Thailand that she studied many cases of thalassemia. This led to years of intensive research of thalassemia and hemoglobinopathies. She identified several abnormal hemoglobins during this time.

In 1954 Minnich returned to Thailand for six months to continue her research on abnormal hemoglobins.

In 1964 Minnich received a Fulbright-Hays Scholarship to set up a hematology lab at the University of Ankara in Turkey.

Virginia Minnich in her office. Pictures of those she credits with making her career hang over her desk.
The University later named it the Virginia Minnich Hematology Laboratory in honor of her work there.

It was while she was in Ankara that Minnich became involved in the study of pica. Pica is the habit of eating dirt and is common in underdeveloped countries and poverty areas in the United States.

Minnich discovered there was a direct link between eating dirt and iron-deficiency anemia. Besides studying pica in Turkey, she also investigated dirt-eating in the United States including the St. Louis area. She reported that certain types of dirt and clay interfere with the absorptions of iron.

“Virginia has an unbounded intellectual curiosity and a tremendous ability to read and educate herself,” says Reinhard. “As a result she has become an acknowledged authority in several fields.

“One of her areas of expertise is in the identification of blood cells, particularly in the bone marrow,” Reinhard says. “The students and house officers, hematology fellows and even the senior hematology faculty members have for many years taken their most difficult bone marrow slides to her for an opinion. We all respect her opinion.”

Minnich has published more than 40 papers and authored 14 abstracts. She has not confined her life’s work to one subject as her papers include work on iron, vitamins, platelets, abnormal hemoglobins, pica, glutathione and carcinogens.

In addition to research, teaching has been an important aspect of Minnich’s career. “I love teaching, especially at the microscope,” she says. “And I love medical students.”

Minnich has taught generations of medical students. “People always recall learning hematology in a memorable and effective way during their sophomore year from Virginia,” Brown says. “She has always had the patience to sit down with a student at the microscope and go over cells and never appear rushed although she is very busy.”

As well as teaching medical students, she has taught more than 300 house staff, internists, pathologists and technicians in night classes on bone marrow interpretations.

In addition to teaching, establishing labs and conducting her own research, Minnich also has been responsible for many new methods and techniques in the division.

“Over the years she has read about various new methods and set them up and kept them going in the lab,” Brown says. “She has always been interested in developing new and more effective routine...
Minnich in 1968 with the late Carl V. Moore, M.D.

procedures, while many of us found it easier to go with the old ways.

"In addition she is very knowledgeable and enthusiastic about morphology," Brown says. "She is the best morphologist around here."

In 1975, Minnich was named assistant director of hematology for Barnes Hospital.

As if she did not have enough to keep her busy, Minnich decided to prepare an audio/slide presentation on a basic course in morphologic hematology. Not only are her slides well used here, but medical schools in Australia, Africa, Israel, Turkey, Bangkok and all over the United States have requested and purchased sets. In fact, wherever her former students are, there is a good chance there is also a set of her slides.

In addition to being hard-working, Minnich is known as a warm, compassionate friend to everyone.

Dorothy Moore, widow of Carl Moore, M.D., has known Minnich for 43 years. "I think Virginia places a high value on perfection," she says. "She has deep loyalties, she is outgoing and has empathy for everyone. She has a very warm personality. She is a work horse too. She and Carl worked together for many years and in many ways they were two of a kind.

"A lot of people tell Virginia their problems because they know she will be understanding and respect their confidence."

Minnich views friendship as invaluable and has kept in contact with many of her associates and students through the years. Besides trying to keep current addresses of former post-doctoral hematology fellows and other staff members, she has become an unofficial historian for the division, keeping pictures of as many people as possible. She is also known for arranging social activities for division members and remembering everyone's birthdays.

Minnich is planning on retiring next year, although she may continue to teach.

"I don't know who will take her place," Brown says. "No one has the same varied interests and skills."

"People at WUMS and people from many parts of the world know, love and respect Virginia," Reinhard says.

Virginia Minnich has certainly earned a place of recognition. When doors were closed to her, she knocked on others. Life undoubtedly was a challenge for her and it is apparent she has successfully accepted it.

In 1972, she received an Honorary Doctor of Science Degree from William Woods College, Fulton, Mo., and in 1975, she received an Honorary Service Award from Ohio State University.

Perhaps her whole personality, her perseverance, tenacity and love of life are evident when, in referring to her life, she says, "I think I must have been born under a lucky star."
John Knowles, M.D. '51: advocate for individual responsibility

By Katherine S. Robbins

John H. Knowles, M.D., president of the Rockefeller Foundation, graduated from Washington University in 1951. He has been involved in many issues, including the individual's responsibility to be healthy as opposed to the idea of the individual's right to be healthy.

"This nation was not founded solely on the principle of citizen rights. Equally important—though too often not discussed—is the citizen's responsibility. For our privileges can be no greater than our obligations. The protection of our rights can endure no longer than the performance of our responsibilities. Each can be neglected only at the peril of the other." John Fitzgerald Kennedy

"The idea of individual responsibilities has been submerged to individual rights—rights, or demands, to be guaranteed by government and delivered by public institutions," says John Hilton Knowles, M.D. '51.

Knowles, president of the Rockefeller Foundation, is a vocal advocate of individual responsibility, particularly where it relates to health.

In his essay "The Responsibility of the Individual," Knowles writes, "...over 99 percent of us are born healthy and made sick as a result of personal misbehavior and environmental conditions. The solution to the problems of ill health in modern American society involves individual responsibility, in the first instance, and social responsibility through public legislative and private voluntary efforts, in the second instance."


"The idea of individual responsibility flies in the face of American history, which has seen a people steadfastly sanctifying individual freedom while progressively narrowing it through the development of the beneficient state," Knowles says.

"This idea originated in the 1930s as an outgrowth of the general social movement in the United States. As a result of the depression, the tenets of laissez-faire and rugged individualism were challenged, and rightfully so. There were a lot of poor people, illiterate people and the aged who simply could not assume the individual responsibility."

Knowles feels the Social Security Act in 1935 was a positive consequence of the movement. "However," he adds, "we then fell into the trap, which we're still in. I believe, of everybody looking to local, state and federal government to legislate tax and spend our way to the promised land."

"An awful lot of this was good, and absolutely necessary: public education is socialized education, public health is socialized health for the real needs of com-

"...over 99 percent of us are born healthy and made sick as a result of personal misbehavior and environmental conditions"
munities that individuals in the private sector cannot meet."

When Knowles speaks of taking individual responsibility for one's health he is not addressing the poor, aged or bereft children. Those people, he believes, should have their needs cared for by and through taxation, legislation and public services.

"I'm addressing myself to 180,000,000 Americans who are literate, quite well educated and affluent beyond comprehension by any measure in the world. These are the people who suffer premature death and disability as a result of personal misbehavior and environmental conditions."

Knowles does realize, however, that individuals cannot take full responsibility for their health. He points out that responsibility cannot be assumed by individuals for additives in food, pollutants in the air or the conning of the advertising which convinces people that they'll be more beautiful if they drink and smoke.

But the individual can play a part in the prevention of disease and premature death and disability. "The affluent, well educated population which does not take responsibility for health are the very people complaining about poor health if they don't drink excessively."

"Sure, I can pay for it, but I don't think it's right. It's either a little more personal responsibility, or social failure because one man's freedom in health is another man's shackles in insurance premiums and taxes."

Knowles believes that the idea of a right to health should be replaced by the idea of an individual moral obligation to preserve one's own health.

Knowles says to observe simple, prudent rules of behavior to maintain health and sense of well-being. Otherwise, premature death, disease and disability will have to be accepted.

"One recent study showed that life expectancy and health are related to the following habits: eating three meals a day at regular times and not snacking between; eating breakfast daily, exercising two or three times a week; sleeping seven or eight hours a night; not smoking; maintaining normal weight and drinking alcohol in moderation or not at all.

However, in this day and age, there are barriers to assuming responsibility for health.

First of all there is a prevailing ignorance about health attributed to the existence of inadequate educational programs.

"I'm a rationalist," Knowles stresses. "I believe in the rule of reason. But how can people have reason if they have not been educated? They will continue making lousy choices and being conned by the wrong thing."

As a result, Knowles emphasizes the need for strong educational programs on the primary, secondary and university levels.

"I taught a course on health at Harvard University. The response was tremendous. The course was absolutely over enrolled to the point where we had to use closed circuit television monitors to accommodate all those students who were interested."

"The students," Knowles continues, "were interested in the health system, nutrition, Blue Cross and what they could do about their own health."

"Aging was also discussed in Knowles course. "People go through critical periods as they age," Knowles says. "In our culture these periods are usually divided by decades. Age 10 brings one period, age 20 another and age 30—look out! When people reach 40 or 45 they wonder what they have accomplished. Our culture is very tough on people."

Another barrier to health is the influence of Madison Avenue on public opinion and life styles. Commodities are easier to sell than health.

"However, headway is being made against this adversary in the form of consumer groups. They have been established to press for truth in advertising... to lead people into better habits instead of bad habits."

The third barrier is the lack of sufficient interest in, and knowledge about, preventive medicine. Knowles subdivides the area into three classes: "primary prevention and the measures employed to prevent disease; secondary prevention, or the early detection of disease so that active therapeutic intervention can be employed to cure or arrest its progress; and tertiary prevention, which comprises those measures that will slow the progress or avoid the complications of established disease."

The fourth barrier is a culture which stresses mass consumption and individual rights as opposed to responsibilities. "We live in a credit minded culture which does it now and pays for it later, whether in drinking and eating or in buying cars and houses," says Knowles.

"Despite all of one's efforts towards enhancing their own health, death and decay are inevitable. The fundamental tragedy to the life cycle is that people are always aging—from the newborn to the elderly," he continues. "Energies decline, attitudes change and many people accommodate that in a very healthy fashion, but many do not."

How an individual chooses to deal with the question of identity is another indication of successful adjustment and good health. "Identities change. One may know now who they are, but in ten years they may not be so certain. It is difficult to project."

"In any culture the identity of the human being is central to a healthy individual. "The ability to find fruitful work, play that is satisfying and perpetual, continuing, loving relationships are essential in order to give meaning to life," says Knowles.

Knowles believes that individual responsibility plays a part in many issues besides health. If he did not have this kind of philosophy, he probably would not be in the position he is in today as president of the Rockefeller Foundation.

In 1946 Knowles applied to 20 medical schools, and only one, Washington University, accepted him. "WUMS took a chance on me," he remarks. But the chance was a good one as Knowles graduated at the head of his class.

After serving as the youngest general director of Boston's Massachusetts Gen-
eral Hospital at age 35, he became, in 1972, the Rockefeller Foundation's eighth president.

The Rockefeller Foundation, a philanthropic organization, was chartered in 1913 "to promote well-being of mankind throughout the world." The Foundation's work is directed toward identifying and attacking the underlying causes of human suffering and need. At present, their focus is on five specific programs which cover the broad disciplines of agricultural sciences, health sciences, natural and environmental sciences, social sciences, and the arts and humanities.

The five programs are: 1) agriculture, called Conquest of Hunger; 2) population and health; 3) international relations; 4) arts, humanities and contemporary values; and 5) equal opportunity.

Agriculture is a priority according to Knowles because such a large portion of the potentially arable land of the world is not utilized. "Meetings are currently being planned to discuss fragile and marginal environments such as hillsides, and soils that have been leached out. Also, we need to consider how that undeveloped land can be put to fruitful use," he explains.

Health has been a major concern of the Foundation since it was established. The Foundation has conducted worldwide campaigns against yellow fever and malaria and participated in the development of public health programs.

In the area of international relations, current interests are in the development of alternate energy sources, the problems of regional conflict, and international monetary affairs.

"We are financing studies on relations between the United States and Mexico and are about to establish a national commission on southern Africa—both of which are potentially explosive areas," Knowles comments. With reference to international monetary affairs Knowles says, "There has been a great yawning chasm between academic columnists, university columnists interested in international economics and the people who actually determine economic affairs—the bankers, the multinational corporations and the ministers of finance. We want to bring together all of those people, each with a different viewpoint, to exchange and share ideas.'

Concerning the Foundation's goal arts and humanities, through its programs, is to make them more of an integral part of the general education process, and to encourage talent among talented artists. The Foundation was responsible for helping with the establish-

"We are financing studies on relations between the United States and Mexico and are about to establish a national commission on southern Africa—both of which are potentially explosive areas,"

"The humanities still enjoy abysmally low support at a time when we're all worrying about values, transformation of the idea of progress, literacy, and even human sexuality," comments Knowles.

The area of equal opportunity relating particularly to minority groups is another one being explored. "Within those minority groups specific reference is being made to the problems of blacks, and, more recently, the hispanic speaking populations in the United States," says Knowles.

The programs of the Rockefeller Foundation are carried out through four closely related procedures. First is the making of grants; second is active, direct responsibility for certain international programs through a field staff; third is the opportunity for education through fellowship awards; and fourth is the dissemination of the work of the Foundation through publications and a close association with the media.

As regards the future direction of the Rockefeller Foundation, Knowles predicts, "We will be smack in the middle of the issues that beset the world. Those have to be the transformation of values, the interdependence of the world—the shrinking planet, the problems of population, health, agricultural and economic development, international relations and reduction of potentially destructive conflicts, youth and minority problems, and employment.

"We must balance those scientific, technical and social concerns with emphasis on the arts and the humanities. Those are the disciplines that give quality and meaning to life; that enhance human understanding; that quicken the ethical sense; and that make people more imaginative and feel better about themselves."
Alumnus enjoys lifestyle on Israeli kibbutz

By Sharon Stephens Murphy

A native of St. Louis, Oliver Biederman, M.D. '58, has been living in Israel on a kibbutz for seven years. He returned recently to visit relatives and attend the May alumni reunion activities. While here he talked about his lifestyle in Israel.

"For me one of the satisfactions of living on a kibbutz is living with nature in a beautiful rural area, away from big cities," says Oliver Biederman, M.D. "And for an American, the striking amount of cultural and other kinds of intellectual stimulation available in such a rural setting is gratifying.

"In addition kibbutz living offers the opportunity to work with others who are attempting to do something beautiful and important. For a physician it offers the chance to practice a satisfying kind of medical and overall preventive and therapeutic care and service."

A kibbutz is a form of communal living predating the state of Israel in 1948. Kibbutzim (the plural of kibbutz) were usually founded on the border of Israel and often served to help defend the country. In addition the economic, agricultural and industrial enterprises of the kibbutzim helped develop the country.

"Many things on a kibbutz are done on a community basis," Biederman explains. "There is a central dining hall where the whole community eats, although some prefer to take food home and prepare it there. There also is a community laundry and many services are performed in a community way.

"It is a very different lifestyle," Biederman says. "Most things in the United States you pay for on a fee-for-service basis. There is no transfer of money on a kibbutz."

While there is no payments for common goods or services, each person is given a budget for incidentals, clothing and traveling. "But the individual budgets are not related to how much one works or how productive one is," Biederman says. "People are strongly motivated, but not for money.

"A kibbutz is a very democratic society," Biederman explains, "in which decisions are made by voting."

Biederman is married and has four children, ranging in age from three to 17. His wife, Carol, is also from St. Louis and went to Barnes Hospital School of Nursing. She has not practiced nursing for several years, however, but has pursued other interests. On the kibbutz she currently gives piano lessons, helps teach English, works in landscaping and occasionally helps care for the children.

The last of the Biederman's children was born on the kibbutz and they think it's a great lifestyle for their children.

"The children at an early age spend their days together in their own children's house, where they are taken care of by very loving, well-trained and good people. They raise them very creatively," Biederman explains.

"When they get a little older, among other things, they also work on the children's farm. It's an actual separate farm with goats, chickens, horses and sometimes cattle. The children have the responsibility for the animals and they also plant some crops. They have one adviser who helps them make decisions.

"Our grade school children go to school at our kibbutz and the high school is at another kibbutz.

"Contrary to what people think, including those in Israeli cities, the parent-child relationship is very close," Biederman says. "I think it is much closer than in cities."

Families spend from 4:30 to 8:30 together each day. "The parents have finished all their work and responsibility by this time and have few things to distract them. There are no worries about bills or going to the store, etc.

The Biederman's live on a kibbutz located in the panhandle near the Lebanon and Syrian borders. While kibbutzim may have populations varying from less than 100 to one or two thousand, most have around 500 to 1,000 people. Biederman serves as physician for five neighboring kibbutzim.

"I decided in the late 60s or early 70s to try a lifestyle in Israel. I planned originally to work in a hospital, but there were some delays. I decided to be interviewed..."
People interested in kibbutz living are interviewed and screened by one of the kibbutzim movements or through Jewish Agency. These organizations assist people in finding a kibbutz that fits their needs. People first go to a kibbutz on a trial basis; after a length of time they are accepted as full members.

"Becoming a kibbutz member is really a lifelong, all encompassing commitment and responsibility," Biederman stresses, "on the part of the kibbutz and the individual. No matter what, the kibbutz continues caring for the individual."

Biederman is the sole primary care physician for 2,500 to 3,000 people. "I work with a medical care team at each kibbutz," he says. "Once a week we meet to discuss organization and individual patient problems. We also frequently discuss some medical topic of interest. We have a physical therapist, a social worker and a psychologist, who does mostly preventive work.

"I have regular clinic sessions and am on call for emergencies. If hospitalization is necessary, the patient is taken to the appropriate hospital, about an hour away. "The kibbutz has its own ambulance and a defibrillator, so we can provide fairly good emergency care for heart attacks and other serious problems," Biederman says.

"Kibbutzim also have sickrooms for people who do not have families or who are very ill," he says. "It's not a hospital, but a building with rooms where people can be cared for in bed. This arrangement utilizes our medical services very efficiently."

Biederman feels people on kibbutzim are healthier and happier. "I see little emotionally-based illness," he says. "But in all fairness, the process of becoming a kibbutznik is selective. I think they probably select people who are healthier to begin with and I have the impression that we have a very healthy lifestyle."

Part of Biederman's routine is making housecalls, most often at the children's houses. "Housecalls are easier on a kibbutz," he says, "because we know everybody and it's a small place. We make our calls on bicycles. No cars are allowed within a kibbutz, although they are available for travel outside the kibbutz."

Kibbutzim are for the most part autonomous communities and are usually financially solvent. The kibbutz where Biederman lives is both agricultural and industrial. "The main crops are cotton, alfalfa and orchards, predominately apple. They also raise turkeys. There is a shoe and sandal factory, an alfalfa factory which processes alfalfa for poultry and livestock feed, a cider and juice factory and the newest one is a plastic factory in which they make plastic bags that replace burlap bags."

"Cattle raising and fish farms are also common in the area, but not on our kibbutz."

"The secret is that when things are done communally they become more efficient," Biederman says. "It's not a communist society, but more inclined to be a socialistic one."

Biederman says that the houses on a kibbutz are much smaller than in cities. "They don't need to be so large because many of the things you usually do in a house are done elsewhere in a kibbutz. We eat at the dining hall so we don't have a large kitchen and most of our children sleep at the children's house so we don't need so many bedrooms. We have less house to take care of so we are not the servant of a large house."

Because of the communal lifestyle, individuals have more time to pursue the things they enjoy. "It's a rich cultural way of living," Biederman says. "Many people have compared kibbutzim to Jewish Community Centers."

"There are groups which meet to pursue a variety of interests such as ceramics, leatherwork, artwork, etc. There are also chorus and dance groups."

"There are many parties and clubs for different age levels," Biederman says. "Many people are really into nature because it's such a beautiful area and the weather is similar to that of southern California. The bird life there is extremely exciting to me. We are on a major migratory route between Africa and Asia. There are valleys and canyons that you can hike."

"There are also movies twice a week and we now have television and can receive from Israel, Jordan and Lebanon."

Biederman says there have been attempts at kibbutzim-type communities in many parts of the world although they usually are not successful. "One person told me that the reason it has worked in Israel is because when Israel first began the kibbutzim, it was an under-developed land with highly developed people. The people who first started the kibbutzim were from a rich cultural background mostly from Europe. The land was cheap and undeveloped. Where our kibbutz is, for example, there were so few trees that they were given names. Now, where we live looks like a country club with tennis courts and a swimming pool. It's really a park-like atmosphere with trees and flowers. It's clean and beautiful, with lots of fresh air and storks flying overhead."

"It was just the combination of the people and the land and opportunity which made it work so well. Kibbutzim make money and they are successful."

"It's not perfect," Biederman says. "Nothing is. But I find it one of the most gratifying and beautiful lifestyles I have ever seen."
Graduation 1978

By John C. Herweg M.D.

Graduations are certainly not rare occurrences—but for the graduates of the School of Medicine, their families and friends, it is a special day. John C. Herweg, M.D. ’45, associate dean and a veteran of many graduations, writes of his impressions of the 1978 graduation and the graduating class.

Friday, May 19, 1978, was a very special day. First of all, it didn’t rain which made it a somewhat special May day this year in St. Louis. But more importantly, May 19 was Graduation Day. The day was bright and sunny and Washington University’s Quadrangle was beautiful with its ivy-covered walls and stately trees. There was a colorful academic procession followed by awarding of honorary degrees, a graduation address and finally the big event—the awarding of degrees to graduates including 131 new Doctors of Medicine.

Later, at the Stouffer’s Riverfront Towers in downtown St. Louis close to the Arch, the happy graduates of the School of Medicine and their even happier spouses, families and friends enjoyed a leisurely luncheon followed by the traditional Senior Program. Dr. Francis Witkowski, president of his class for all four years, welcomed the audience of more than 800 and introduced the speaker. The graduates had selected Dr. Franz Ingelfinger, Editor of the New England Journal of Medicine for so many years, to address their class, and he admirably fulfilled his role. He emphasized the need for “continuous” education of physicians rather than “continuing” education and suggested, with wry humor, that regular reading of the New England Journal of Medicine might be a good starting point.

Dean Kenton King announced each graduate, and Vice Chancellor Samuel Guze presented diplomas and awards. Each new physician had his/her moment of glory. It was a happy time! The Class of 1978 graciously shared honors with two members of the faculty, Dr. Dale Purves, Department of Physiology and Biophysics and Dr. Robert Paine, Department of Internal Medicine, who were selected as Teachers of the Year.

As I watched this event which culminated twenty or more years of formal education for each of these young physicians, I thought back to August 28, 1974 (a mere 1,361 days ago), when these same young men and women had matriculated in the Washington University School of Medicine. If one could have measured their motivation on that hot summer day, the “motivationometer” would have been bursting at the seams. Eagerness and excitement tinged with a bit of insecurity characterized their mood. They were like a group of three-year-old thoroughbreds at the starting gate at the Kentucky Derby. They were eager to run the race, waiting only for the bell. The race was fast, and the track was rough at times. It took them a while to learn that the goal was to finish the race and not necessarily to come in first. There were triumphs and frustrations, successes and failures, gratifications and doubts. The secret was to keep the goal in sight, value the goal, put forth the effort and persevere. These 131 young physicians have done just that.

For the past 27 years I have been a medical student “watcher”, first as a pediatrician and in the last thirteen years as a medical student affairs administrator. I like to think I still practice pediatrics with just a bit older clientele. The growth and development of medical students is a fascinating biological and psychological phenomenon. The excitingly rapid physical and motor growth which characterize the infant and young child has essentially ceased in the young adult would-be medic.

Physical changes are restricted to additions or subtractions of beards and mustaches or changes in hair styles, alterations in weight, the appearance of happiness in the faces of young people in love or the tired eyes and occasional irritability and lack of humor in the overworked student. Interesting changes in attire occur with some regularity. The Sunday suit, shirt and tie, scrubbed-face appearance of the medical school applicant is rarely if ever seen again following the admissions interview. The jean and T-shirt or slacks and blouse garb of the freshmen persist into the early sophomore year. Suddenly on Tuesday mornings when students go “to the wards”, short white coats and even neckties appear, and stethoscopes are
casually but proudly draped about necks. The professionalization of the physician has begun.

There is tremendous personal and professional growth of students in the junior clinical clerkship year. The opportunities for active participation in patient care, the broadening experiences of sampling the major clinical disciplines, the gradual realization that the basic medical sciences are really essential and do have pragmatic application in helping sick people and the thrill of working closely with bright, dedicated, young resident physicians and exciting, talented teachers of our full-time and part-time faculty—all of these experiences and more serve to mold the young professional. Role models are chosen and long-term career plans begin to be shaped as the students enter their senior elective year. An individualized and self-chosen curriculum, increasing patient responsibility, a bit more time for selective medical reading and more awareness of the need for continuous self-education as stressed by Dr. Ingelfinger combine to make the senior year the best yet.

And now the last of the alphabetically-arranged graduates, Dr. Philip Zazove, has been handed his diploma which proclaims him a Doctor of Medicine. The race hasn’t ended; in fact it has barely begun. The track stretches in many directions and extends for 35, 40 or 50 years. These young physicians are superbly equipped to serve their fellow men in competent and compassionate ways which will bring gratification and distinction to them, perhaps fame to a few and pride for Washington University.

The medical class of 1978 includes five graduates of our Medical Scientist Training Program. These physician-scientists have earned both the M.D. and Ph.D. degrees and are committed to careers in academic medicine. Undoubtedly a number of other graduates will become academicians. Fifteen graduates are planning careers in family practice; five will serve the nation in the Armed Services; and ten others are committed to practice in underserved areas in the National Health Service Corps. Many will eventually enter medical or surgical specialties. A young woman graduate will return to her native Britain for post-graduate training. Another young woman physician is committed to serve her religious order. Almost all of our graduates will provide patient care or teach patient care. Some of our graduates, both black and white, will provide medical care for underserved, minority groups in our society. These young doctors are literally 1,361-day miracles. They have every right to rejoice and be proud—and the faculty and those of us in administration rejoice with them. We wish them health, happiness, productivity and prosperity—Godspeed.
Awards given to graduates; two faculty members

Twenty-nine of the 131 graduating seniors received academic honors at the Washington University School of Medicine graduation. They are:

Kim David Colter, West Brook, Conn., Merck Manual Award; Raymond Pearson Davidson II, Joplin, Mo., Samuel D. Soule Award in Obstetrics and Gynecology; Jeffrey Edward Doty, West Redding, Conn., and Dorothy Kovitz Senior Award in Surgery; Charles D. Ettleson, Albany, N.Y., Sidney I. Schwab Prize in Psychiatry and Samson F. Wennerman Prize in Surgery; Mark Edwin Frisse, Highland, Ill., Upjohn Achievement Award and Robert Carter Medical School Award; Daniel David Goran, St. Louis, Alexander Berg Award in Microbiology and Immunology; Margaret Campbell Hochreiter, Rockville Centre, N.Y., American Medical Women's Association, Inc., Scholarship Achievement Citation; Robert Love Huck, Houston, Texas, Merck Manual Award; Scott Herald Kirk, River Forest, Ill., Sidney I. Schwab Prize in Neurology; Thomas R. Kleyman, St. Louis, Missouri State Medical Association Award; Joan K. Kreiss, British Columbia, Canada, Lange Medical Publications Book Award; Peter Barry Kurnik, Manlius, N.Y., Edward Massie Prize for Excellence in Cardiology; Timothy J. Ley, Lakota, Iowa, Medical Fund Society Prize in Surgery, St. Louis Internist's Club Book Award and Alpha Omega Alpha Book Prize; Thomas D. Margulies, Cedar Rapids, Iowa, Mosby Scholarship Award; Dominic Meldi, Wilsonville, Ill., Medical Fund Society Prize in Medicine and Alfred Goldman Book Prize in Diseases of the Chest; Ross Eric Morgan, Wheat Ridge, Colo., Mosby Scholarship Award;

Carol J. Nelson, Westby, Mont., Dr. John Esben Kirk Annual Award for Scholastic Excellence; Susan Jorden Nelson, Cambria, Wis., St. Louis Pediatric Society Prize; Lee Stuart Portnoff, St. Louis, Mosby Scholarship Award; Barbara D. Reed, Columbus, Ind., Lange Medical Publications Book Award; William Andrew Renie, Springfield, Mo., Jacques J. Bronfenbrenner Award; Eugene Harold Rubin, Brookline, Mass., Mosby Scholarship Award; Mary Rebecca Schwartz, Honolulu, American Medical Women's Association, Inc., Scholarship Achievement Citation and Merck Manual Award; George Putnam Stricklin, Piaitka, Fla., James Henry Yalem Prize in Dermatology; John Davis Stull, Olney, Ill., St. Louis Pediatric Society Prize; Bruce Jay Taller, Syosset, N.Y., Hugh M. Wilson Award in Radiology; Robert Wells Warren, Athens, Ga., George F. Gill Prize in Pediatrics; Francis Xavier Witkowski, Lic, N.Y., Richard S. Brookings Medical School Award; Stephen Granville Young, Topeka, Kan., Mosby Scholarship Award.

The graduating class also honored two faculty members whom they chose as "Teachers of the Year." They were Robert Paine, M.D., clinical professor of medicine, and Dale Purves, M.D., associate professor of physiology and biophysics. Their respective departments will receive $10,000 each from the Alumni Association in recognition of this honor.

Where they're going

This year 138 medical student participated in the National Intern and Resident Matching Program. Forty-two graduates or about 32 percent will participate in residency programs in St. Louis area hospitals. Sixty graduates chose medicine residencies; 15-family practice, 13-surgery, 10-pediatrics, 9-obstetrics & gynecology, 7-radiology, 5-pathology, 5-rotating, 5-psychiatry, 2-neurosurgery, 1-orthopedic surgery, 1-anesthesiology and 1-ophthalmology.

ALABAMA
Birmingham
Carraway Methodist Hospital
Scott Kirk, Surgery

Mobile
University of So. Alabama Medical Center
Gaylord Walker, Surgery
CALIFORNIA
Fresno
Fresno County Dept. of Health
John Brim, Psychiatry

Los Angeles
University of California
Sandra Spaulding, Internal Medicine
University of California Hospital
Jeffrey Doty, Surgery
Harry Geggel, Ophthalmology
L.A. County—U.S.C. Medical Center
David Jensen, Neurological Surgery
Veterans Administration Center
Kwong-Fai Kwong, Internal Medicine

Redding
University of Calif. (Davis) Affil. Hospitals
Scott Malan, Family Practice

San Diego
U.S. Naval Medical Center
Harold Kent, Surgery
John Shega, Flexible Medicine
University Hospital
Joan Kreiss, Internal Medicine
Richard Wahl, Internal Medicine

San Francisco
San Francisco General Hospital
Ada Jemison, Psychiatry
University of Calif. Medical Center
Stephen Young, Internal Medicine

Stanford
Stanford University Hospitals
Lee Portnoff, Internal Medicine

COLORADO
Denver
Presbyterian Medical Center
Margaret Montana, Internal Medicine
University of Colorado Hospitals
Marcy Gibb, Family Practice
Alan Sedman, Internal Medicine

CONNECTICUT
Farmington
University of Conn. Affil. Hospitals
Rochelle Weber, Family Practice

New Haven
Yale—New Haven Medical Center
Randi Leavitt, Internal Medicine
Robert Silverman, Internal Medicine

DISTRICT OF COLUMBIA
Georgetown University Hospital
Michael Lincoln, Internal Medicine
George Washington Univ. Hospitals
Moses Albert, Internal Medicine
Martha Michalski, Internal Medicine

FLORIDA
U.S.A.F. Rgn. Hosp., Eglin AFB
Donald Spoon, Family Practice

Gainesville
Wm. A. Shands Teaching Hosp. & Clinics
Cathy Cantrell, Ob-Gyn
George Stricklin, Internal Medicine

Miami
University of Miami Affil. Hospitals
Charles Gluck, Internal Medicine

Tampa
University of So. Florida Affil. Hosps.
Daniel Goran, Internal Medicine

ILLINOIS
Chicago
Mount Sinai Medical Center
Kweli Amusa, Internal Medicine
University of Chicago Clinics
Nathaniel Crump, Ob-Gyn

Peoria
St. Francis Hospital
John O'Connor, Family Practice

Springfield
Anthony Galloway, Internal Medicine

IOWA
Des Moines
Iowa Methodist Hospital
Mary Stuart, Internal Medicine

Iowa City
University of Iowa Hospitals
Donn Turner, Neurological Surgery

Sioux City
Siouxland Medical Foundation
Sr. Jeffrey Engelhardt, Family Practice

KANSAS
Kansas city
University of Kansas Medical Center
Hermann M. Koller, Family Practice

Kentucky
Lexington
University of Kentucky Medical Center
Robert Capps, Internal Medicine
John White, Internal Medicine

MARYLAND
Baltimore
Johns Hopkins Hospital
William A. Renie, Internal Medicine

MASSACHUSETTS
Boston
Children's Hospital
Richard Finkel, Pediatrics
Massachusetts General Hospital
Timothy Ley, Internal Medicine

MINNESOTA
Minneapolis
Northwestern Hospital
Rollie Ackerman, Internal Medicine
Theresa Poindexter, Internal Medicine
University of Minnesota Hosps.
Carl Goldstein, Internal Medicine

Rochester
Mayo Graduate School of Medicine
Robert Clayburgh, Orthopedic Surgery
Charles McQueen, Internal Medicine

MISSOURI
Columbia
University of Missouri Medical Center
Kim Colter, Family Practice

St. Louis
Barnes Hospital
Diane Burzilaff, Pathology
Raymond Davidson, Ob-Gyn
Mark Frisse, Internal Medicine
Vernon Holers, Internal Medicine
Richard Hoover, Pathology
Dominic Moldi, Internal Medicine
Carol Nelson, Internal Medicine
Richard Orlowski, Internal Medicine
Frederic Regenstein, Internal Medicine
John Schweitzer, Pathology
Thomas Winckel, Ob-Gyn
Francis Witkowski, Internal Medicine
The Jewish Hospital of St. Louis
Robert Bastian, Surgery
Andrew Dickler, Internal Medicine
Margaret Hochreiter, Internal Medicine
Denise Johnson, Surgery
Roger Kurlan, Internal Medicine
Mark Levinson, Internal Medicine
Felicia Nowak, Internal Medicine
John Oldham, Internal Medicine
Ronald Palmer, Radiology
St. John's Mercy Hospital
Robert Auffenberg, Diagnostic Radiology
St. Luke's Hospital  
Mary Horn, Internal Medicine  
Robin Wilkinson, Internal Medicine  
St. Mary's Hospital  
Joseph Elterman, Internal Medicine  
Washington University Affil. Hosps.  
Charles Ettelson, Surgery  
Carolyn Koppenol, Psychiatry  
Keith Mullenger, Diagnostic Radiology  
Eugene Rubin, Psychiatry  
Bruce Schwartz, Surgery  
Carol Spellen, Psychiatry  
Bruce Thaler, Diagnostic Radiology  
John Vander Woude, Surgery  

NEW YORK  
Brooklyn  
Brookdale Hospital Center  
Joseph Marchetta, Family Practice  
New York City  
Presbyterian Hospital  
Thomas Kleyman, Internal Medicine  
Syracuse  
Syracuse Medical Center  
Brenda Kurnik, Internal Medicine  
Peter Kurnik, Internal Medicine  
Larysa Melnyk, Pediatrics  

NORTH CAROLINA  
Chapel Hill  
North Carolina Memorial Hospital  
Keith Brewer, Surgery  
Kenneth Rhinehart, Surgery  
Durham  
Duke University Medical Center  
Robert Huch, Internal Medicine  
Margaret Robinson, Diagnostic Radiology  
Robert Schmitz, Family Practice  
Charles Stricker, Diagnostic Radiology  
Robert Warren, Pediatrics  

NORTH DAKOTA  
Grand Forks  
University of North Dakota Affil. Hosps.  
John Baird, Family Practice  

OHIO  
Cincinnati  
Cincinnati General Hospital  
Carol Stull, Ob-Gyn  
John Stull, Pediatrics  
Cleveland  
Case-Western Reserve Univ. Affil. Hosps.  
Laura David, Ob-Gyn  
Douglas Mayers, Anesthesiology  
Thomas Murphy, Internal Medicine  
Carlton Pearse, Internal Medicine  

OKLAHOMA  
Oklahoma City  
University of Oklahoma Hospitals  
Stanford M. Moran, Internal Medicine  

OREGON  
Portland  
St. Vincent's Hospital  
Clark Sisk, Internal Medicine  

Pennsylvania  
Danville  
Geisinger Medical Center  
David Nasca, Flexible  
Hershey  
Milton S. Hershey Medical Center  
Andrew Rich, Surgery  
Philadelphia  
Temple University Hospitals  
Dennis Parent, Internal Medicine  

TENNESSEE  
Nashville  
Vanderbilt University Affil. Hosps.  
Charles Robinette, Diagnostic Radiology  

TEXAS  
El Paso  
William Beaumont Army Hospital  
Paul Webber, Ob-Gyn  
Galveston  
University of Texas Medical Branch Hosp.  
David Watkins, Internal Medicine  
Houston  
Baylor College of Medicine  
Debra Gunn, Ob-Gyn  

Mary Schwartz, Pathology  
University of Texas Affil. Hosps.  
Frances A. King, Surgery  
San Antonio  
Brooks Army Medical Center  
Jimmie Thompson, Rotating Ob-Gyn  

UTAH  
Salt Lake City  
University of Utah Affil. Hosps.  
Carol Foster, Pediatrics  
Andrew Juergens, Family Practice  
Ross Morgan, Internal Medicine  
Barbara Reed, Family Practice  
Philip Zazove, Family Practice  

VIRGINIA  
Charlottesville  
University of Virginia Hospital  
Barry Farr, Internal Medicine  
Ann Henry, Internal Medicine  
Jeffrey Milbrandt, Pathology  

WASHINGTON  
Seattle  
Group Health Coop. of Puget Sound  
Henry Mustin, Pathology  

WISCONSIN  
Milwaukee  
Medical College of Wisconsin Affil. Hosps.  
Nicholas Couper, Internal Medicine  
Nola Minkitani, Internal Medicine  

ICELAND  
University of Iceland Affil. Hosps.  
Ellen Mooney, Rotating
The AOA Lectureship is one of the high points of my professional experience, and I want you to know that I deeply appreciate the opportunity to speak with you today.

I am concerned, seriously concerned, about the psychological and intellectual well-being of the individual physician, whether practitioner, scientist, or administrator. You are likely to be subjected to mounting pressures from within the profession and outside of it, and unless you understand, cope with and work to reduce those pressures, your peace of mind and your professional activities may be compromised.

Pressures from outside the profession develop because people’s expectations are not fulfilled. A week does not pass without some vivid expression of the public’s unhappiness with physicians. Newspaper stories, prime time television programs and feature films describe the doctor as an overpaid superspecialist, a medicaid ripoff artist, a killer of fetuses, a seducer of patients and a ghost surgeon who performs unwarranted hysterecomies in exhorbitantly priced, mismanaged hospitals. From these stories, one might think that it is the lucky patient who will not receive nitrous oxide instead of oxygen and who will not become infected with hospital-born, highly virulent, antibiotic-resistant bacteria. Patients complain of spending long hours in waiting rooms only to see doctors who deprive them of personal interest, and with whom their most meaningful interaction is via the financial statement. A sampling of recent headlines and editorial cartoons reveals our unfortunate public image (Slides 1-3).

The public now views the doctor as part of a corporation and medicine as a growth industry. According to a recent study, the net income of the physician is higher and increasing faster than that of any other professional. If we extrapolate from today’s estimates, a median annual income of $63,000 growing at a rate of 9.3 per cent a year, then those of you who enter private practice will earn about six million dollars in your lifetimes. Years ago, society deified the doctor. It tolerated and even admired the traditional affluence of the physician. My father, a general practitioner, often made house calls at night, and his car was a large Buick. His impoverished patients loved him for his compassion and availability, and regarded his vehicle as a symbol of his excellence. The age of idolatry is over. The sole reminders of those halcyon days are the reruns of Marcus Welby, the doctor who surpassed perfection en route to sainthood in color each week.

Because of widespread media coverage, the transgressions of a small minority condemn the large majority in the eyes of the public. The same precedence and weight are given to anecdotal incidents as to world-pervading events. A medicaid fraud in Brooklyn receives press coverage equaling that of a major World War II battle. These are, of course, irrelevant times, in which all professions and institutions are being scrutinized and criticized. The chief justice of the supreme court announces publicly that 50 per cent of trial law attorneys are incompetent. Nader’s raiders allege example after example of corporate irresponsibility, the deliberate manufacture of unsafe products, payoffs to foreign countries in return for preferential treatment, and weapons sales to oppressive dictatorships. And Hamilton Jordan would be the first to agree that the government, in particular the executive branch, frequently receives adverse publicity for apparently trivial events. Sissela Bok, in her recently published book Lying: Moral Choice in Public and Private Life quotes a 1975 poll in which 69% of the respondents believed that the government had lied to the people consistently in the previous ten years.

Public disclosures evoke political, legislative and judicial reactions. On June 7, 1975, Senator Frank E. Moss dons the worst-looking clothes he can find and presents himself for treatment at the East Harlem Medical Center, taking a cold. After a cursory history and physical exami-
nation, he receives extensive x-rays and blood tests, chiropractic manipulation, and is sent to the next-door medicaid pharmacy for Darvocet, Erythromycin and Phenergan. Assailing the physician has enormous political potential today, and the curtailment of professional freedom results. From the legal standpoint, angry patients initiate often non-meritorious malpractice suits, and make us accountable to the legal profession. Malpractice claims have risen from 6,000 per year in 1965 to approximately 20,000 in 1975. Although that only represents one claim per 100,000 doctor-patient encounters per year, it amounts to about one claim for every ten doctors nationally, and, in high-risk states, perhaps one claim for every three or four physicians.

### The public now views the doctor as part of a corporation and medicine as a growth industry.

The biomedical researcher has not eluded the wrath of the public, nor legislative, executive and judicial intrusions. Laetrile symbolizes society's impatience with science and reveals an understandable ignorance of scientific thought and methodology. The scientific community criticizes the lay public's faith in quackery, and may itself be criticized for seemingly frivolous research undertakings. Senator Proxmire's golden fleece award, which I consider a politically inspired insult, was given recently to investigators supported by the National Institute of Mental Health for sociological studies in Peruvian brothels, and epitomizes the new public mistrust of academic freedom. The NIH budget has stabilized, in terms of overall purchasing power, and political interventions have fostered increased disease-targeting of federal research funds. A prominent eastern university is accused of mismanaging scientific grant money, and federal auditors are now probing the books and practices of many schools. Doubtless the audits will reveal some inappropriate activity and counter-productive regulations will descend upon us all.

In fact, the public is challenging the lofty status of the physician and the freedom of the scientist. Medicine and science are each in a contradictory position; they function as private or quasi-private enterprises for the public welfare. The public takes its welfare ever more seriously. Accountability and control may well insure health care on the public's terms, as an inalienable right and not a privilege, and the emergence of a scientific establishment, alas, that is required to respond to public priorities.

There is some justification for the public's current attitudes toward doctors. We are not merely innocent recipients of society's generalized disaffection, we are not merely bearing the blame for some minor flaws in an otherwise perfect system. We must assume responsibility, if not do penance for the past, then certainly to improve the outlook. What have we done wrong? Our health care delivery system is extraordinarily expensive and lacking in effective overall coordination. Too many of us have become overspecialized, and have not dealt with our patients as individuals to a sufficient degree. Some of us have become too affluent at the public's expense; more importantly, the medical care we give is not yet good enough, and despite all this, we have, until very recently, denied the public access to the inner workings of the profession. Our public relations must be the laughing stock of medicine, and we are penalized for the medical mistakes of American history. The public and the politico-legal system no longer accept basic biomedical research as an article of faith, as a cultural attribute somewhat akin to the Philadelphia Orchestra. Our major scientific victories, such as the ability to prevent polio and measles, rubella and hepatitis B, and the successful treatment of tuberculosis, at an annual cost saving of perhaps 10 billion dollars, have only whetted the appetites of the people for larger advances. They pay for us; they want to know what we are doing, why, and why we aren't succeeding faster.

### Conclusion

If societal disaffection pressures the physician, so also does the rapid evolution of the science of medicine and the societal milieu in which medicine is practiced. The doctor's knowledge seems progressively in arrears, no matter how limited the specialty. Only a considerable effort can prevent the practice of outdated, apocryphal medicine that harms patients, increases the likelihood of external criticism and of malpractice litigation. There is no doubt that the mass of medical literature is increasing almost exponentially, and that our discriminatory powers are being severely taxed. As Durack has suggested, our inevitable failure in the struggle to keep up often generates anxiety and guilt. The best possible health care delivery requires not only the application of state-of-the-art scientific medicine, but also the ability to relate to patients well and to deal with their illnesses in the broad setting of family and society. Although skillfully contrived personal relationships can never substitute for knowledge, we do not know enough to depend entirely on sci-
ence in practicing medicine. A storehouse of life experiences, and a knowledge and awareness of social and cultural trends best equip the doctor to provide care in the fullest sense. Unfortunately, relevant experience and knowledge are not easily acquired during a long and arduous training period, much of it in the protective womb of the hospital. There is evidence to suggest that medical students become progressively less oriented to patient needs. And new opportunities for personal growth don't suddenly materialize upon completion of training; a busy practice must be generated and a belated financial stability rightfully sought. Conservatism, in the sense of resistance to change, and further depersonalization are the potential consequences.

We share with other active professionals the almost inevitable conflict between the demands of work and those of family and home. The intensity of our occupation breeds a preoccupation that can interfere with meaningful family and social life, prevent relaxation and lead to depression.

So much for the bad news. I hope that you're not discouraged by the preceding comments. They have obviously been dramatized for emphasis, but are accurate. I thought it might be useful for me to make some suggestions that could help you in minimizing the pressures you will experience.

Speaking first to the future practitioners, as you know by now, doctor-patient rapport determines in no small part the efficacy and safety of the health care delivered. A caring attitude on your part will serve your patients well. Express an interest in them as people, and examine common interests. I thought it might be useful for me to make some suggestions that could help you in minimizing the pressures you will experience.

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I don't think that public relations per se should be a main goal of the practitioner. Bad enough that the fear of malpractice litigation prompts us to practice defensive medicine. Can you imagine what it would be like if public image concerns dominated our professional activities? I can see us offering to our patients, as a hospital in California has recently done, a lottery in which the first prize is an all-expense paid vacation to Hawaii, or perquisites such as green stamps, free copies of self-help books such as *Your Erroneous Zones* or *Looking Out for Number One*. Whether or not we accept such facetious commercialism, the doctor-patient relationship happens to be the best possible vehicle for public relations available to the medical profession. Being more concerned will not only improve patient care but the image of the doctor as well.

Examine your own motivations and personality carefully, and select activities within medicine accordingly. Those of you who do not derive great pleasure from the doctor-patient relationship should avoid primary care roles. If you don't you will be unhappy and so will your patients, and you will emerge as poor representatives of your profession. If you do enjoy such relationships, then your own needs and those of society might best be served by a career in primary rather than secondary or tertiary care. The public wants more primary care physicians and residency quotas have been established in some states to satisfy that desire. More stringent legislation may well be forthcoming, since the cluster tertiary care specialties, with few exceptions, in academic centers and their close affiliates. Tertiary care is hard to practice well apart from the ancillary facilities and intellectual support base of academe. Primary care, not tertiary care, is what is needed in the periphery. Not every community hospital need have a coronary bypass team or a full-time endocrinologist. Neither the cost nor the limited usefulness would be justified. The high price of widespread tertiary care is passed on to the patient through increasing third-party premiums and therefore raises the hackles of health care administrators and legislators, whose collective conditioned response is to generate confining laws.

I need not dwell on the importance of continuing self-education—it is a sine qua non of our profession. One approach that I have found helpful is as follows: first, define the goals and limits of your review; second, set aside a regular time for review, a time when you are particularly alert; and finally, employ a simple record-keeping system for the material you have reviewed. In my mind, the physician should keep abreast of important social issues and cultural trends, particularly those that may have impact on physical and psychological health; drug abuse, increasing sexual freedom, the youth countercultures and the women's liberation movement are but a few examples from the present and recent past. In this regard, the media people have done us a great service: we are flooded with assessment of and commentary on the modern scene.
Those of you who will be scientists and academicians should give moral support to the practitioners. Your tendency to be cynical about the empiricisms of the art of medicine should only enhance your regard for those who do not have the luxury of using data from carefully controlled experiments in making key decisions. How human it is to err in the absence of solid evidence. The practitioners among you should have regard for the academicians. You might be interested to know that many practicing physicians appeared to support Nixon's war on science by writing letters praising curtailments of the NIH budget. Whatever negative attitudes you might harbor may extend from your medical school experiences, when those whom you regarded as ivory tower basic scientists lectured to you unceasingly about information that you thought had no obvious relevance, and when you perceived that your clinical education was in the hands of overly specialized investigators who rarely treated patients. Somehow, you managed to acquire substantial knowledge, many new skills, and the capacity to criticize data. The world of the academician is, in its own way, as demanding and stringent as that of the practitioner. Future academicians and future practitioners should maintain a healthy regard for administrators—hospital presidents, deans, vice-chancellors, and chancellors—did I forget anyone? In some ways, their tasks are the most difficult of all. What practitioner or scientist has arrived at the office in the morning, full of enthusiasm for work, only to find it occupied by hostile students protesting the manufacture of napalm, the high cost of parking, the cafeteria food, and the anatomy course? The talent for mediating among many constituencies, creative management of dwindling dollars, and, increasingly, dealing with public and private establishments, is certainly a commodity to be respected and promoted. Let me hasten to add that I am not advocating a non-critical, mutual admiration society. Critical thought and free expressions of diverse points of view are essentials of medicine, in all of its ramifications. Your criticisms will be most effective, however, if they are rational, constructive, and delivered in a spirit of respect and understanding.

How human it is to err in the absence of solid evidence.
The practitioners among you should have regard for the academicians

Aspiring investigators should not be dissuaded by the conservatism of the federal research budget. Excellent researchers continue to receive grant money, and I see no change in that trend. The NIH is spending nearly three billion dollars on research, and much of it in the form of investigator-inspired grants that allow the scientist maximum flexibility. It is obvious, however, that your obligations toward science will have to extend beyond excellence in the pursuit of truth. Government restrictions of academic freedom are imminent, and can only be combatted by large-scale attempts to educate the public and the politicians about the importance of that freedom to the future health of the world. This teaching process will require that you emerge from your comfortable laboratories and deal with non-scientists in terms that they can understand, as individuals, as faculty members, and as participants in scientific societies. No matter how well intentioned, public statements promising breakthroughs must be avoided, to protect the populus from the inevitable frustrations that follow.

I encourage you, as potential leaders of American medicine, to set standards of excellence, and with those standards in hand, to play active roles in assessing and, if necessary, adjusting the system in which you work. Practitioners and scientists find it all too easy to "leave the decisions to someone else." Without your participation, the political process may regulate medicine and science in a manner that would be deleterious to the health of our people, and discouraging to aspiring physicians and scientists. Accept the responsibility by developing a caring attitude in your private practice, maintaining an alertness to the world about you, and educating the public with caring about your science.

In the last analysis, I don't want to patronize you, but I think it's fair to say that I am very optimistic; you are highly intelligent, you have already demonstrated considerable learning and coping ability, and you are part of a generation of people that exhibits a remarkable conscience. In truth, six million dollars may underestimate your value.
Former director of MIR dies

Hugh M. Wilson, M.D., second director of the Edward Mallinckrodt Institute of Radiology, died April 21 at the age of 72.

Wilson, who received the M.D. degree from Washington University in 1927, had been professor-emeritus at the School of Medicine since 1963. He served as the first chairman of the Department of Radiology at Yale University from 1934-1949. From 1949 until 1963 he was professor and chairman of the Department of Radiology at the School of Medicine, radiologist-in-chief at Barnes and St. Louis Children's Hospitals.

Wilson was to receive the first Gold Medal awarded by the Association of University Radiologists at its annual meeting in May. This medal was established to recognize distinguished academic radiologists for their contributions.

Grant received to study viruses

Why some viral infections persist for months or years is the subject of a study by Jacques Perrault, Ph.D., assistant professor of microbiology and immunology. He has received a $20,000 March of Dimes birth defects research grant to investigate persistent infections.

Certain persistent viral infections during pregnancy cause malformations and mental retardation in babies who become infected before or immediately after birth.

In the simplest case, a virus "takes over" a cell by injecting its own genes, forcing the cell to manufacture new virus particles that eventually burst out, killing the cell and spreading to other cells. But sometimes, for unknown reasons, viral multiplication switches to production of "defective interfering" (DI) particles that cannot carry on the cycle and, in fact, block further spread of intact particles.

"Until recently, these DI particles were thought to be laboratory curiosities," says Perrault. "It is becoming increasingly clear, though, that they can alter the course of infections and probably play a role in virus persistence." Nearly all viruses can give rise to them, he notes.

Working with a virus that infects horses and cattle, Perrault will study the structure, properties and origin of its DI particles for clues to how they interfere with intact virus multiplication and perhaps enable the infection to persist. Evidence from previous research suggests that DI particles may play a role in change from typical, acute infection to a long-lasting, subtle but sometimes deadly one. Persistent viral infections are known to cause certain degenerative nervous system diseases and suspected of causing others, including multiple sclerosis.

Names Make News

E. James Anthony, M.D., Blanche F. Ittleson Professor and Director of the Division of Child Psychiatry, recently has received several awards and honors. He was awarded the Mount Airy Gold Medal which is given annually to an outstanding American physician for "Distinction and Excellence in Psychiatry." He has also been named to receive the Blanche F. Ittleson Award for Research in Child Psychiatry by the American Psychiatric Association. In addition, Anthony is the new president-elect of the Association for Child Psychoanalysis.

Harvey R. Butcher, M.D., professor of surgery, has been named acting head of the newly formed Division of General Surgery. Butcher, a graduate of Harvard Medical School, received his training in surgery at Washington University-Barnes Hospital and has been a full time member of the faculty of the Department of Surgery at the Medical School for the past 25 years.

Ronald G. Evens, M.D., chairman of the Department of Radiology and Director of the Mallinckrodt Institute of Radiology, was elected president-elect of the Society of Chairman of Academic Radiology Departments (SCARD) at its recent meeting in San Antonio, Texas.

Evens also has been appointed to serve for a three year term as a member of the Medical Radiation Advisory Committee of the Bureau of Radiological Health for the Department of Health, Education and Welfare.

Sidney Goldring, M.D., professor and co-chairman of the Department of Neurology and Neurological Surgery, has been appointed to the National Advisory Council of the National Institute of Neurological and Communicative Disorders and Stroke.

Edward G. Jones, Ph.D., M.D., professor of anatomy and neurobiology, has been appointed a Macy Faculty Scholar for 1978-79.

Jones is one of 25 awardees at 19 medical schools in the United States and Canada whose research during the next year will be supported by the Josiah Macy, Jr. Foundation. Jones will continue his research in neurobiology while on sabbatical at Monash University in Victoria, Australia.

Gerald T. Perkoff, M.D., professor of medicine and preventive medicine and director of the Division of Health Care Research, and Virgil Loeb, Jr., M.D., associate professor of clinical medicine and assistant professor of pathology, have been elected to membership in the Institute of Medicine of the National Academy of Sciences.

For the second consecutive year a Washington University School of Medicine professor has been awarded the Paul Hoch Award from the American Psychopathological Association.

What's even more unusual is the two recipients are married to each other.

Lee N. Robins, Ph.D., professor of Sociology in Psychiatry, recently received the award and her husband, Eli Robins, M.D., received it in 1977. The Hoch award is given annually to a person who over a long period of time has contributed to clinical psychiatry and to research in psychiatry.

Both Lee and Eli Robins have received other honors and recognition of their individual work in psychiatry. Both have questioned fundamental premises in clinical psychiatry and have undertaken empirical studies that have changed many views.

Eli Robins, former head of the Department of Psychiatry, has done research in brain biochemistry as well as clinical psychiatry, including basic diagnostic techniques. Lee Robins has studied childhood factors which influence psychiatric disorders in adults, sociopathic personality and drug abuse.
MSTP student O’Leary Award

Jeff W. Lichtman, a student in the Medical Scientist Training Program, was the recent recipient of the first James L. O’Leary Prize for Research in Neuroscience.

Lichtman, who will receive the M.D. and Ph.D. degrees upon completion of the MSTP program, presented his paper on “The Reorganization of Synaptic Connections in the Rat Submandibular Ganglion During Postnatal Development” at the Washington University Neurosciences Symposium, at which he was honored.

Lichtman received the O’Leary Prize for his research which demonstrated how neurological connections are modified during development to result in greater specialization of functions.

The O’Leary Prize, which was established in memory of the eminent neuroscientist James L. O’Leary, M.D., Ph.D., recognizes the most original and important accomplishment in neuroscience research at Washington University. O’Leary was professor and head of the Department of Neurology at the School of Medicine. His career at Washington University extended from 1928 until his death in 1975. O’Leary devoted himself to training young investigators, many of whom now hold academic positions throughout the country.

Cowan named Salk Fellow

W. Maxwell Cowan, Ph.D., professor and head of the Department of Anatomy and Director of the Division of Biology and Biomedical Sciences, has been named a non-resident Fellow of the Salk Institute.

Non-resident fellows of the Salk Institute participate in scientific affairs of the Institute and, together with resident research professors, constitute its senior academic body. Cowan joins several other non-resident fellows who play an important role in determining the future direction of the Institute’s research.

Student’s research gets national honors

Donald Kennerly, a student in the Medical Scientist Training Program at the School of Medicine, has placed in two research award competitions at the 1978 National Student Research Forum at the University of Texas Medical Branch at Galveston.


Cordonnier receives Guiteras Award

Justin J. Cordonnier, professor emeritus of surgery and former chairman of the Division of Urology, was awarded the Guiteras Award at the Annual Meeting of the American Urological Association. The Guiteras Award is the highest honor bestowed by the AUA.

Two alumni named to specialty colleges

Charles E. Lockhart, M.D. ’52, Springfield, MO, has been named to the Board of Governors of the American College of Surgeons. As the Governor for Missouri, Lockhart will represent all of the surgical Fellows of the state in the affairs of the College.

For the past two years, he has served as chairman of the American College’s Advisory Committee for the State of Missouri.

C. S. Lewis, Jr., M.D. ’54, Tulsa, OK, has been named chairman of the Board of Governors of the American College of Physicians. Lewis has served as Governor for Oklahoma of the College for the past three years and has one more year to serve in that capacity.

As chairman of the Board of Governors, Lewis will chair the five member executive committee which forms a portion of the steering committee of the College.

Lewis recently completed a year as president of the Oklahoma State Medical Association and serves as a member of the Board of Governors of the American Board of Internal Medicine.

The plaza area outside McMillan Hospital.
"Declaration of Geneva"

I solemnly pledge myself to consecrate my life to the service of humanity.
I will give to my teachers the respect and gratitude which is their due;
I will practice my profession with conscience and dignity:
The health of my patient will be my first consideration:
I will respect the secrets which are confided in me:
I will maintain by all the means in my power, the honor and the noble traditions of the medical profession:
My colleagues will be my brothers:
I will not permit considerations of religion, nationality, race, party politics or social standing to intervene between my duty and my patient.
I will maintain the utmost respect for human life, from the time of conception; even under threat, I will not use my medical knowledge contrary to the laws of humanity.
I will make these promises solemnly, freely and upon my honor.

(Adopted by the General Assembly of the World Medical Association in Geneva, Switzerland in September, 1948—amended 1968—is “a modern restatement of the Oath of Hippocrates.”)