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OUTLOOK MAGAZINE

Washington University School of Medicine

Spring 1980





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Volume XVII, Number 1

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Photograph by Denny Silverstein.

The photographer and the graphic treatment combine for a new view of a part of the West Pavilion isolated from public scrutiny. "The Works" is a world peopled by the contractors' crews and construction consultants. The maze of conduit and piping, sensors and controls is not without that kind of beauty which lies in the eyes of the beholders. Story begins on page 14.

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by Glenda King Rosenthal



"The third time is the charm . . ." Maxims notwithstanding, luck had little to do with the birth of Christopher Eugene Stramberg. His mother is diabetic and had lost two pregnancies and almost all hope of ever bearing a healthy baby.

Reducing The Risks In Diabetic Pregnancies

After losing two pregnancies as a result of diabetes, one in the first trimester and the second at term, Nancy Stramberg gave away her baby clothes and furniture. That was a year ago. Today, Nancy, 35, is the mother of a healthy baby boy — an achievement that took much more than luck. Christopher Eugene Stramberg's safe arrival was the result of physicians working together to solve a common problem, plus modern equipment which aids in the treatment of diabetes and Nancy's own willingness to do her part in controlling her disease.

Nancy was fortunate enough to have an internist and obstetrician with the foresight to realize that her problem required the help of a specialist and equipment, such as the artificial pancreas and insulin pump, which are simply not available in a private office. Nancy was also hospitalized for almost 9 weeks at the end of her pregnancy in order to monitor her insulin requirements continuously. "Of course, there were places I would rather have been," she says. "But I did it because of the end result — a healthy baby that I thought I would never have."

Lee A. Rigg, Ph.D., M.D., assistant professor of obstetrics and gynecology in the perinatal division, was instrumental in helping Nancy achieve her goal. Unfortunately, most of the diabetic women, who comprise a small percentage of the child-bearing population, are not referred to an obstetrician with an expertise in diabetes.

"Of course, it's always possible for a pregnant diabetic to be treated by an obstetrician without this endocrine knowledge and still end up with a healthy baby. However, it's very risky and most fortunate when it does happen," Rigg says.

Some physicians, such

as Nancy's, realize they don't have the expertise to handle the myriad problems associated with a diabetic pregnancy, and they refer those patients to Rigg. Others do have the expertise, but lack the time in a busy private practice to devote the effort necessary in caring for these women as well as keeping up with the literature and recent advances.

"For these reasons, I feel these patients should be referred to an academic center where there is someone who has the facilities and devotes all of his efforts to the problem," Rigg says.

Some private physicians refer their patients to the perinatal laboratory for tests, such as ultrasonography, and then continue to manage them. "Another thing that is becoming more common is for an obstetrician who has great rapport with a diabetic patient to manage her from an obstetrical point of view and ask me to see the patient in consultation to direct the care and management of her diabetes," Rigg says. "Most patients appreciate the physician who is honest enough with them to say 'I don't know enough about this to do it all.'"

As more and more physicians become aware of the pregnant diabetic's special problems, referrals to major medical centers such as WUMS increase. But even in major centers this expertise is not always available.

There are many things that physicians should be aware of which can indicate diabetes. "A woman presenting for a prenatal examination should have a good family history taken; and any unexplained stillbirths, congenital anomalies in previous children and large-birth-weight infants should be investigated. Diabetic women tend to produce large-birth-weight infants because the excess amount of nutrient

material in maternal circulation crosses the placenta. The infant is not diabetic and produces plenty of insulin, so whatever excess nutrient material supplied is stored by the fetus."

Rigg also feels any obese woman should be routinely tested for diabetes. "This is done by some people in some centers. Unfortunately, it is not done as a routine procedure across country. Many, many women are missed who have the potential for problems with diabetes and pregnancy."

Not all physicians think these indications of diabetes are important. Rigg is one who does. "My position is supported by a conclusion reached by a recent meeting of the American Diabetes Association and the American College of Obstetrics and Gynecology," he says. "It was concluded that not only should the obvious indications of diabetes be investigated thoroughly, but that every woman who presents for prenatal care should have a diabetic screening in the form of a random blood sugar determination. This type of exam has not been routinely done, and whether the obvious indications are investigated is questionable." Ideally, they should be.

Under even more ideal circumstances, a diabetic woman contemplating a pregnancy should see a specialist before she conceives. Her diabetes should be under rigid control at the time of conception because congenital anomalies in the infant of a diabetic mother are correlated to the woman's pre-pregnancy control. "Congenital anomalies that develop in infants of diabetics occur within eight weeks of the last menstrual period. We don't know what causes anomalies in this group, but we do know the chances of developing anomalies are greatly reduced if the woman's diabetes

is well controlled prior to conception and in the early weeks of pregnancy. This is probably one of the most important things I could say about care of the diabetic woman. Unfortunately, this almost never happens. Most women conceive without realizing the association. Once they present, it's too late to do anything about it."

There is a brighter side to the picture. In major medical centers with the facilities and expertise, fetal and maternal mortality due to diabetes is down dramatically.

"Maternal mortality in the diabetic population is double that in the normal population, usually from toxemia and diabetic coma. This figure is accurate if you take into consideration the total population across the country; however, in centers such as this one, maternal mortality approaches zero."

In some remote, rural areas the perinatal death rate associated with diabetes can be as high as 20 percent. However, in a good center, the mortality rate should be approximately what it is in the non-diabetic population. "In major medical centers around the country, the rate is now down below five percent. And there are approximately six major centers where the incidence of fetal mortality is down to one percent. We're one of those centers."

Lowering the fetal and maternal mortality figures is certainly a success. But is it enough? Rigg doesn't think so. "It depends on how one defines success. If one defines success as simply the delivery of a living child, then our success rate could be considered high. If that child continues to survive, that could also be considered a success. However, many of the infants of diabetic mothers have severe problems and must spend long periods

of time in the neonatal intensive care unit. I feel we do not have success as long as we have such severe morbidity."

In order to attain what he does consider success, Rigg maintains a high degree of personal and professional involvement with his diabetic patients. Ideally, this involvement begins before the woman conceives. In most cases, it begins with the woman's first prenatal visit.

At the initial examination, Rigg admits the woman to the hospital for a series of tests, including kidney function tests and an ophthalmological (eye) exam. "First, I determine what degree of regulation the patient requires and the degree of other complications due to her diabetes. This gives me a baseline from which to work. By determining these factors, I can tell if the patient is deteriorating during her pregnancy and treat her appropriately."

During this first hospitalization, the woman's blood sugar level is tightly regulated. "As pregnancy progresses, the placenta enlarges and its concentration of hormones increases. Many of these hormones antagonize the effect of insulin. So the woman is rigidly regulated initially, and as the antagonism increases she is repeatedly regulated. Fasting blood sugar levels during the course of a non-diabetic pregnancy are about 70 mg/dl and after a meal may go to 110 to 120 mg/dl. These are the levels I try to achieve in the pregnant diabetic population."

In addition to this tight blood sugar control, Rigg feels it is very important to determine the gestational age of the pregnancy. "One of the most important things an obstetrician can do in any pregnancy is to date it accurately. If the patient develops medical complications and her health is deteriorating, or if there is some

fetal compromise, one must know if the baby is far enough along to have a reasonable chance of surviving. An early pregnancy test and pelvic exam, and an accurate dating of the last menstrual cycle, are extremely important, because after 20 weeks gestation it is more difficult to date the pregnancy.

"The use of ultrasonography helps. Two ultrasounds between 20 and 30 weeks will give us a very good estimate of when the baby should be delivered."

Simultaneously with determining the woman's condition and the gestational age of the pregnancy, Rigg begins an individualized treatment program based upon the needs of each patient. He also must deal with the problem of patient compliance, which takes on great importance in the diabetic pregnancy.

"Patient compliance is one of my biggest problems," he says. "I don't think anyone ever accepts the disease; some try to reject it and put it out of their minds. Some women will not stick to their diet. Somebody has a baby shower for the woman, she feels she has to eat a piece of cake, and her blood sugar shoots up. Others will not take their insulin on schedule," Rigg says.

"A pregnant diabetic patient may be hospitalized seven or eight times, for a week at a time, in order to maintain regulation and control. After so much of this, some women develop cabin fever and really want out. Some will even sign out of the hospital when they're not well controlled and against medical advice."

Rigg believes that these women really need a perinatal care unit where they can have social interactions with others who have similar problems. Such a unit is not currently available. "Compliance is terribly important; these women need a support group among themselves."

Lee A. Rigg, Ph.D., M.D., assistant professor of obstetrics and gynecology in the perinatal division, believes in knowing his patients' individual and medical and personal needs in managing a diabetic pregnancy. The willingness of the woman and her husband to comply and cooperate is extremely important. Rigg gets a great deal of personal satisfaction from seeing his patients take home a healthy baby.



If the patient is well controlled and complying with her treatment schedule, Rigg may allow as much as two weeks between office visits. For the most part, however, the diabetic woman is seen weekly and sometimes as often as twice weekly. "If I get to the point where I feel twice a week isn't often enough to maintain good control, then I hospitalize her," he says.

Rigg emphasizes the importance of knowing each woman's individual needs on a medical and personal basis. "I need to know *her* — her lifestyle, her willingness to comply with treatment, all outside factors, including her husband, that influence her general well-being," he says. "In other words, I have to care. It's not uncommon for me to call a woman to find why she missed an appointment. I think in many instances these women don't realize the gravity of their problem, so a phone call from me can jolt them into being more aware. Missing an appointment can have disastrous consequences, so it's important that they comply with my suggestions and know that I care."

Close observation of the diabetic woman has replaced plasma and urinary estriol testing which was formerly done at the School of Medicine. "We used to ask our patients to collect every drop of urine daily in order to perform estriol determinations. Anything less than that would have resulted in an inaccurate test result. This was very difficult to achieve, and we found that the plasma estriol testing wasn't much better than a poor urine collection."

This type of testing is still being done at some other institutions, but Rigg feels that close observation of the patient, rigid control of blood glucose and frequent testing of fetal well-being has contributed to WUMS' lower morbidity and mortality rates of both mother and infant. "We also perform serial ultrasounds of fetal growth over the last few months of pregnancy and serial tests of fetal well-being over the later weeks. This, combined with individualized, close observation is the best method of care possible for the diabetic woman," he says.

With no set protocol for every diabetic pregnancy, the clinical

acumen of the physician takes on great importance. Rigg feels that one cannot develop this expertise by taking care of a few diabetic women a year. "You'll stay rusty and never really learn," he says. "I've reached the point where I can simply look at one of my diabetic patients and sense that something isn't right." More often than not, tests will confirm that there's a problem. This ability comes from dealing with many women who share a common problem and recognizing little signs that would normally not be noticed. "Of course I am not infallible."

The diabetic pregnant woman must be observed closely throughout her entire pregnancy, but weekly stress or non-stress tests are begun at approximately 30-32 weeks gestation. These tests indicate fetal well-being. "The literature indicates that if the mother and fetus are doing well on any given day, they will continue to do so for a week," Rigg says. "There have been a few cases reported in the literature in which this testing proved to be predictive for only three days. In all instances, fetal losses occurred with normal test results."

This might indicate the need for more frequent testing, but here again Rigg feels it is important to look at each individual case. "In those instances where the woman is compliant and well controlled, I would continue with a weekly non-stress test. If I have a patient who is less compliant or who has severe medical complications, then I will test the fetus as frequently as every other day."

Many of the problems associated with the diabetic pregnancy occur close to term. If an individual is well controlled and having no complications, Rigg would allow the pregnancy



to progress to 38 or 39 weeks gestation. "If I'm at all concerned, I may perform an amniocentesis to determine fetal pulmonary maturation," he says. "Even if the fetus could do well on the outside and appears to be mature, I would leave the situation alone as long as both mother and fetus are stable."

Rigg does have some reservations about allowing his diabetic patients to go beyond term because so many of the problems associated with the disease develop around that time. "No one is willing to allow these women to go beyond the due date. In my own mind, I think that if everything is stable the diabetic woman could go two weeks overdue just like any other woman, but I don't want to experiment with anyone to prove my hypothesis. So, if the fetus is at term and doing well, we go ahead and deliver and not take any chances."

Rigg must make the decision when to deliver the infant of a diabetic mother, and then decide how. If the woman is stable, the cervix is ripe and softened, and

the fetus is in a normal presentation, then an induction would usually be performed. "If there is a malpresentation or if the maternal or fetal well-being is not very good, then a Caesarian delivery is the safest thing to do," he says. "Not all diabetics can deliver naturally, but many of them can."

Whether as the primary care physician or as a consultant to another obstetrician, Rigg monitors the diabetic patient throughout her labor and delivery. "I'm always there because these women must have tight regulation of blood sugars throughout this critical time," he says. "Her insulin requirements are going to change tremendously upon delivery of the placenta."

Because this requirement changes so drastically and so rapidly, Rigg says the patient who is going to be delivered should not have any long-acting insulin administered that day. "She also should probably not have any short acting insulin administered either, except in very small doses. Even if a diabetic woman goes into labor spontaneously, we have a few hours in which to work. When she goes into labor,

we simply don't administer any more insulin. If I feel she does need more insulin, I give it intravenously rather than subcutaneously because the half life in circulation is less than ten minutes."

The labor and delivery of a diabetic woman should be managed by someone with the knowledge to handle her special, and sometimes potentially dangerous, problems. The newborn infant of the woman may have problems with polycythemia, hypoglycemia, hypocalcemia, or respiratory distress, so a pediatrician or neonatologist is usually present at the delivery in order to handle those problems unique to the infant.

The special care requirements of the diabetic woman do not end at delivery; rather, they continue during her post-partum period. "Just as in all aspects of treating the diabetic woman, her post-partum requirements are extremely individualized. I usually keep them in the hospital post-partum longer than I would a non-diabetic woman. I want them to go home well regulated so they

won't be hyperglycemic. I want a positive feeling that they will remain well controlled. If they're in good condition when they're discharged, I will see them back in six weeks. If there is a problem, I see them as often as necessary."

The key to a successful pregnancy and delivery of a healthy infant lies in rigid control of maternal blood sugar levels by good management of insulin requirements, diet and exercise. The non-diabetic woman will produce more insulin during pregnancy, with the amount of insulin produced increasing until approximately 34-36 weeks' gestation. The level then reaches a plateau. "The reason for this is because hormones from the placenta, especially human placental lactogen, increase tremendously, and cortisol in maternal circulation roughly doubles. These hormones antagonize the action of insulin at the peripheral level. No one really knows just what this peripheral level is, but I feel it's something at the membrane level.

"The insulin requirements of the woman with maturity-onset diabetes will increase the same as those of the non-diabetic individual. But the maturity-onset diabetic is more resistant for other reasons than just maternal-placental hormones. She may need as much as a 100 percent increase in insulin dosage requirements as her pregnancy progresses."

The juvenile-onset diabetic will similarly have an increased requirement, but the increase is usually 30-40 percent over the usual requirement. Both maturity- and juvenile-onset diabetes present problems, but Rigg says juvenile-onset is more labile.

"We can bring about tremendous swings in the blood sugar levels with smaller increments of insulin,



whereas in maturity-onset it takes much larger doses to produce the same change."

The juvenile-onset diabetic generally has more problems related to the disease in addition to those related to her pregnancy. These women usually have had more time to develop the major vascular complications of diabetes, such as hypertension, retinopathy and nephropathy.

But in most cases, the insulin requirements of both groups will increase. "I tend to worry if one of my diabetic patients has a decreasing insulin requirement because this indicates decreasing placental or renal function. If placental function decreases, the hormone production decreases and the antagonism lessens, but with decreasing placental function, the baby may be in trouble!

A decreasing insulin requirement can also be an ominous sign because insulin is cleared in great part by the kidneys and this might indicate decreasing degradation and excretion by the kidneys. If I were to see decreasing insulin requirements, I would immediately examine the woman's kidney function and repeat testing for fetal well-being."

Good insulin coverage and rigid control throughout the pregnancy can ease or eliminate the complications both mother and fetus face. Probably the worst thing that can happen to a fetus is for its mother to develop diabetic ketoacidosis, which usually is a result of inadequate insulin coverage.

"Here again we see the need for a diabetic woman to be

treated by someone who can stay on top of her insulin requirements. This condition may be precipitated by a simple infection. A urinary tract infection or an abscessed tooth can completely throw off good diabetic control and increase the insulin requirements tremendously. I've seen a bad cold or the flu throw patients into diabetic ketoacidosis."

The diabetic woman is also at added risk for developing pregnancy-associated hypertension (pre-eclampsia and eclampsia). This condition can contribute to fetal loss. "We also find more polyhydramnios (excess fluid around the fetus) in the pregnant diabetic." This condition is noted initially on physical examination and confirmed through ultrasound. It can impinge upon the woman's respiratory efforts, in



some cases is associated with congenital anomalies and can contribute to complications during labor and delivery."

Rigg emphasizes that most of the complications of the diabetic pregnancy can be eased if the maternal blood sugars are kept under tight control. He also believes that the well-controlled diabetic should live a life not greatly unlike that of a non-diabetic individual. In most instances he feels that the diabetic woman can probably have more than two pregnancies. "It all depends on how well she is controlled and the degree of her complications related to the disease. If a patient has had diabetes for a number of years, has marginal kidney function and neovascularization in the retina of

the eye, I would encourage her not to have repeated pregnancies. However, I would never tell a woman she must terminate her pregnancy, but would advise her of the risks of continuing, including blindness and death. Not all conditions due to diabetes worsen with a pregnancy. She has the right to decide, after counseling, and the right to try. But if a woman does have severe eye involvement, for example, I would counsel her on future pregnancies and contraception. Many of these women are now opting for sterilization."

Fortunately, the diabetic woman who is pregnant or contemplating a pregnancy has many more options than she used to. In a good institution with the facilities to handle her special problems and in the hands of a specialist such as Rigg, these women can anticipate a more relaxed pregnancy and an improved prognosis for the birth of a healthy baby. The trauma to them has been lessened. The future is brighter, but much more needs to be done in research and in educating the lay and the medical communities.

This is the end result to which Rigg is working, both clinically and in his lab. He is one of only two people at WUMS doing basic, prospective research on diabetes and pregnancy.

"I have a control group and diabetic group that I'm currently studying," he says. "I'm looking at insulin receptor activity in the normal pregnancy because to understand what's abnormal I have to know what's normal. I eventually hope to study newly diagnosed diabetics who are also pregnant and not yet on insulin. These are hard to find.

"Diabetes in pregnancy has been a terribly neglected area in both obstetrics and endocrinology. Too many women have

It is important for the diabetic woman to have her disease under tight control before conception. The insulin pump is one method of achieving that.



suffered because of lack of knowledge and concern. We need more specialists in this area and more funding to conduct the necessary research."

Riggs is a hands-on physician. When he cares for a diabetic woman, he knows it is a high risk situation. "I know we're still at the frontier of what's going on," he says. "So when one of my patients is laboring or being prepared for delivery, I don't feel that I can sit in my office and wait for someone to call and tell me she's ready. It's my responsibility to be there. If a problem does occur, no one has to track me down; I'm there to handle it to the best of my knowledge and judgement."

He cares for these women and usually reaps the reward of seeing his patients take home a healthy baby, something many of

them had given up hope of ever doing.

This desire to be involved with people is one of the main reasons Rigg entered medical school. He has a Ph.D. in physiology and did two years of post-doctoral research. "But it was all rats. And I needed people," he says. "You can get the basics from rats, but you have to study people to learn about them and be able to help them. That's why I went to medical school, took a four year residency and another two years of post-doctoral research."

Nancy Stramberg and many, many other women like her are very glad he did. ■

"There is nothing so thrilling to watch as growth, and to be a part of the process brings joy which only my colleagues can understand."

1975 Outlook

Mildred Trotter's education began in a one-room schoolhouse in Monaca, Pennsylvania. In 1913, she finished elementary school (extreme right), and in 1916 she completed high school (below), both in Beaver, Pennsylvania. After being graduated from Mount Holyoke College in 1920 (right), she accepted a research position at Washington University School of Medicine because the work could be credited towards a master's degree in anatomy.



Mildred Trotter: "With Honor In Her Own Country"

by Marion Hunt

"A prophet is not without honor save in his own country." (Matthew, Chapter 13, verse 57) Despite St. Matthew's statement, this May Washington University awarded honorary degrees to two distinguished professors emeriti. One of the recipients was Dr. Mildred Trotter. This award has particular meaning because of her remarkable success in what has been, traditionally, a "man's world" — the world of scientific research and medical education. Chancellor William Danforth read the citation:

"Mildred Trotter, daughter of Mount Holyoke College. For her inspired teaching, for her scientific leadership in physical anthropology and in the understanding of bone as a tissue, and, most importantly, for her qualities of enthusiasm, of warmth and goodwill that bring out the best in others, with special gratitude and affection from nearly 4,000 medical students . . ."

Spontaneously, the entire Washington University Medical School class of 1980 rose to applaud her.

No citation, however eloquent, can capture her 60 year career. Mildred Trotter, Ph.D., professor emerita and lecturer in anatomy and neurobiology, came to Washington University in 1920 as a young graduate student and research assistant; six decades later, she continues to contribute to the life of the University as a scholar, a teacher, and an exemplar of what a determined and gifted woman can achieve.

Her career in the Department of Anatomy has coincided with a revolution in the field. Between 1920 and 1967, the focus of anatomy became functional and microscopic. New technology for studying cells, and new insights into their nature, enable scientists to look at organic structure in far more depth and detail than was thought possible 60 years ago.

Yet during this period Mildred Trotter published over a hundred papers, all of which have dealt not with cells but with the larger structures of the body. Her principal contributions have been to the understanding of bone. As her colleague, Dr. Stanley Garn (professor of nutrition of the University of Michigan) noted at a 1976 symposium in her honor, "she has been responsible for the largest single increase in our knowledge of bone, both as a tissue and as the primary locus of the mineral mass of the body." Her research is notable for its quality, consistency and persistence.

At a time when the technology and direction of her discipline were changing dramatically, Trotter's decision to retain a focus on what has traditionally been called "gross anatomy" is only one sign of her independent spirit. Her informal autobiography, "Anatomy in My Time" (now in the Washington University Medical School Archives) contains a wealth of information about her life and work. Though she places considerable emphasis on other members of the department, the portrait of a highly independent woman emerges from these pages. Meeting Trotter confirms this impression. In the interests of "getting the facts straight," she agreed to a series of interviews this spring in her office on the 4th floor of the North Building.

Mildred Trotter decided to take a position at Washington University Medical School just after her graduation from Mount Holyoke in 1920, a time when few young women were beginning scientific careers. She chose the St. Louis position in preference to a higher paying job in her home state, Pennsylvania, as a high school biology teacher. "Not until I learned that the work I would do at Washington

University could be credited toward a master's degree in anatomy did I agree to come," she remembers. A new position in the department was funded by a local donor interested in research on hair growth. Dr. C.H. Danforth, then associate professor of anatomy, wanted a bright college graduate to work with him. "One of my zoology teachers at Mount Holyoke, Dr. Christianna Smith, recommended me to him," Trotter recalls.

As an undergraduate, she had majored in zoology because of an interest in the subject and the college's strength in the field. The zoology department's head, Dr. Ann Haven Morgan, and two other women professors, Dr. Christianna Smith and Dr. Elizabeth Adams, were among her teachers. With their guidance, she "never even thought, let alone worried, about being a woman in science." Their photographs hang in her office today, eloquent testimony to their impact on her life. Trotter explains her loyalty to Mount Holyoke in three words: "It made me." (She plans to attend her 60th class reunion this year.)

Her first night in St. Louis was not, however, an auspicious occasion. She arrived after a long, hot train ride from Pennsylvania and stayed in a boarding house on Vandeventer Avenue. There she had her first experience with cockroaches. Fortunately, this proved a temporary living situation; she found comfortable quarters with other women graduate students in McMillan Hall on the Hill campus — where she lived until 1932.

She recalls, "In the fall of 1920, when I reported to Dr. Danforth, the entire department of anatomy consisted of six men." Its chairman was Dr. Robert J. Terry, a distinguished anatomist and the only full-time professor retained after the Medical School's 1910 reorganization. Trotter admired his scholarship and teaching methods. "His research interests covered a wide range in the field of gross anatomy, both human and comparative, with concentration on the skeleton," she remarks. Terry had strong convictions about how anatomy should be taught. A believer in the motto "study nature, not books," he never lectured on any portion of the body until students had dissected it. Terry was a major influence on her as a scholar, teacher, and mentor.

In Trotter's five decades of teaching anatomy, she followed Terry's methods. His emphasis on learning by doing, from nature rather than from books, echoed a crucial aspect of the 20th century reform in medical education. As she points out, "Even now, it's important for students to know that textbooks may not describe *their* cadaver." Each human body is different, and the ability to discern differences is a crucial part of medical education. "Learning to observe is one of the chief benefits of studying anatomy," she says.

Between 1921 and 1924, Trotter assisted in Danforth's research on hair growth, completed the requirements for a master's degree, and received the Ph.D. in anatomy. Since Terry was out of the country at the time, Dr. Joseph Erlanger, Chairman of the Department of Physiology, headed her dissertation committee. Her thesis was entitled, "The Life Cycles of Hair in Selected Regions of the Body." In 1922, she was promoted from research assistant to assistant in Anatomy. On completing her graduate studies, she was made instructor in the department.

"The year 1925-26 was an exciting one for me," she recalls, "because I received a National Research Council Fellowship for a year of study at Oxford under Professor Arthur Thomson." The fellowship was in physical anthropology, a field closely related to classical anatomy. Trotter had planned to continue her doctoral research on hair, but "when the term at Oxford began, Professor Thomson asked me to give up the hair problem in order to study and compare the vertebral columns of skeletons in the University Museum's collection."

These specimens came from two very different locations and time periods: ancient Egypt and Roman Britain. From that study came Trotter's first publication on bone: "The Moveable Segments of the Vertebral Column in Old Egyptians" — in the 1926 volume of the *American Journal of Physical Anthropology*. This experience had a lasting effect on her research. "I discovered that I liked studying skeletons better than studying hair," she remarked simply. When her year in England was over, she applied for and received support for a second fellowship year at Western Reserve under Professor T. Wingate Todd. When Terry offered her a promotion to assistant professor in the Department of Anatomy, she decided to return to St. Louis.

In this new position, Trotter's special responsibility was to assist Terry in teaching gross anatomy to medical students. She began this collaboration with him in 1926 and succeeded him as coursemaster in 1941. Terry had written the basic laboratory guide for anatomy in 1927. Trotter updated this guide in 1946 and her version was in use until 1967. During these years, the number of hours which medical students devoted to the gross anatomy course decreased as scientific attention turned increasingly to the burgeoning fields of microbiology, physiology, biochemistry and microscopic anatomy. Despite this change, gross anatomy is still a basic component of medical education. During her full-time teaching career, from 1926 to 1967, Trotter taught nearly 4,000 medical students (43 classes) including two Nobel laureates, Dr. Earl Sutherland and Dr. Daniel Nathans. Among the faculty members listed in the current medical school catalogue, no fewer than 371 were her students. Not merely the quantity of students but the quality of her teaching was notable. As W. Maxwell Cowan, M.B.B.Ch., Ph.D., (Edison Professor of Neurobiology, professor and head of the department of anatomy and neurobiology) said recently, "Mildred Trotter's teaching was exemplary for three reasons; it was rigorous, conscientious and honest."

In 1930 she was promoted to associate professor of anatomy. During the 1930s she continued her research on human hair. She maintained this interest because physical anthropologists considered hair to be among the chief distinguishing features of races. But her choice of research subjects was also pragmatic. Hair samples for study could be obtained without charge and required no physical care. Since departmental research funds were scarce until after World War II, scientists themselves often had to care for, or pay for the care of, their experimental animals. "Feeding, watering, and cleaning cages every day left too little time for teaching," she recalls. The close connection between Trotter's research interests and the developing field of physical anthropology led her to become a founding member of the American Association of Physical Anthropologists in 1930. She later served as the Association's president, from 1955 to 1957, and as associate editor of its journal for ten years.

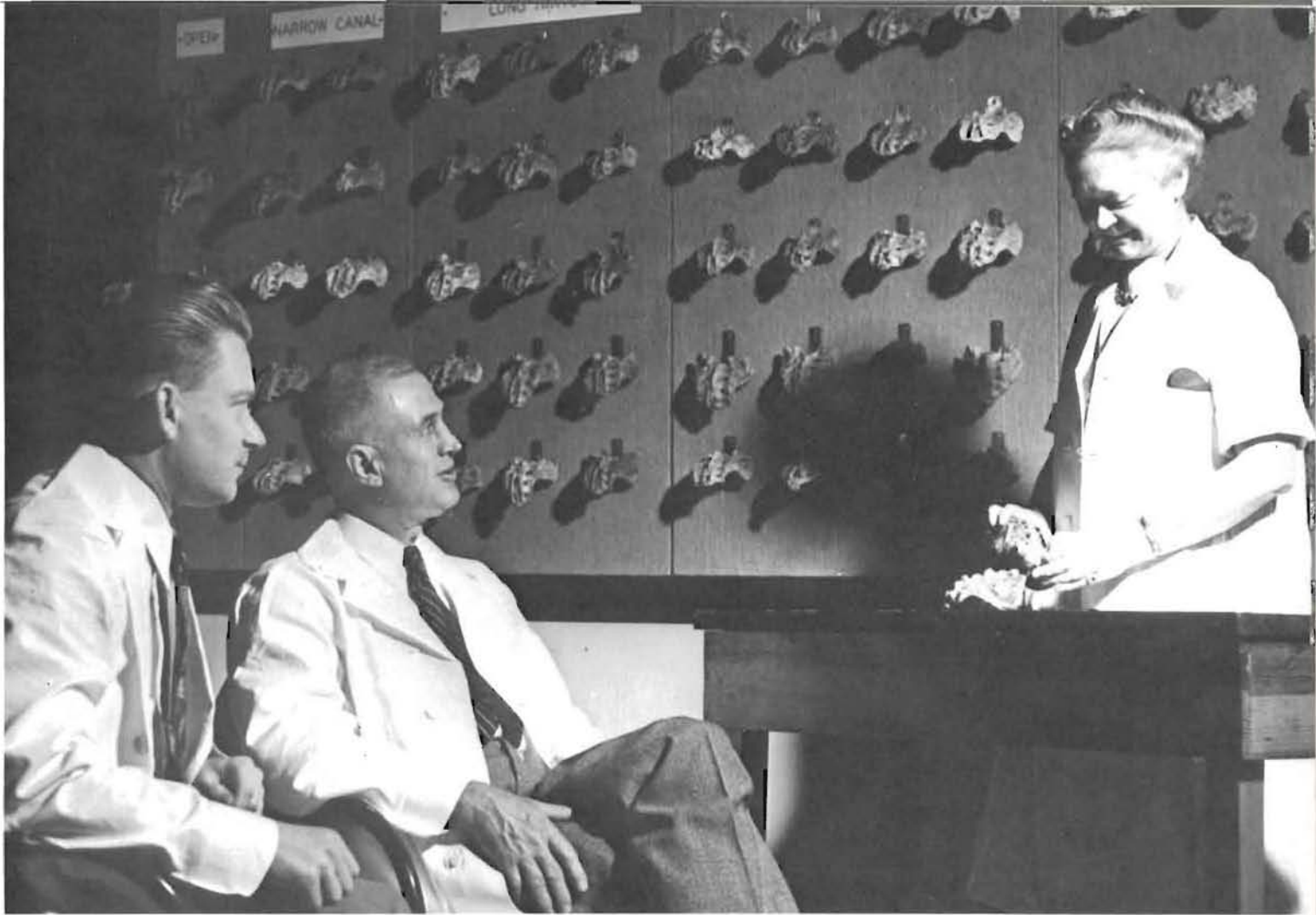
In 1944, Mildred Trotter won First Award for her study of the sacrum at the Southern Medical Association meeting. With her (right) are Dr. E.V. Cowdry, then chairman of the anatomy department at Washington University School of Medicine, and Dr. John Finerty.

Despite the quality of her scholarship and the level of her professional activity, Mildred Trotter received less recognition and fewer opportunities than came routinely to male colleagues of her ability. As she said to her then-chairman, Dr. Edward Dempsey, many years later, "It has not been my privilege to plan very far ahead; rather I had to watch for an opportunity and make the most of it." Throughout her career, women in science were a distinct minority, frequently regarded with skepticism, if not suspicion. Even when they managed to produce work of high quality under inauspicious conditions, they were often not given the same rewards as their male counterparts. Marie Curie notwithstanding, most women who attempted scientific careers at this time were simply not taken seriously as scholars. Women and science were thought incompatible. Some of Trotter's associates at Washington University Medical School were aware of this difficulty. When she was offered a contract to write a textbook of anatomy for nurses, Dr. James L. O'Leary brusquely advised her, "It may add to your income, Trotter, but it won't add to your scientific prestige." Since women faculty were customarily paid less than men of similar rank, she could well have used the extra income from such a book. Because she cared about her reputation as a serious scientist among her male peers, she accepted O'Leary's judgment.

In 1935, Trotter received an invitation to become head of the department of anatomy at the Woman's Medical College of Pennsylvania. Founded in 1855, this school had been one of the few which offered women a good medical education in the 19th century. It was also distinguished by a predominantly female faculty. Precisely because the institution was sexually segregated, its status was tenuous — particularly after women were admitted to more prestigious, previously male medical schools at the end of the 19th century. The salary was attractive, but Trotter was sensitive to this issue. Her years at Washington University had convinced her that it was a better environment for medical research and education. Despite the problem of being a woman in a largely male institution, she preferred that challenge to the one offered by the Woman's Medical College and declined the invitation.

Mildred Trotter continued to make the most of her opportunities at Washington University (and elsewhere) in the following years. The outbreak of World War II led to new challenges for her. In 1943 she became a special consultant to the U.S. Public Health Service, working on the anatomical aspects of caudal anesthesia. Her teaching responsibilities increased during the war years, as they did for the entire medical school faculty. Education was accelerated so that classes entered every nine months between July of 1942 and October of 1944. Since she had inherited the responsibility for teaching gross anatomy when Terry retired in 1941, all the accelerated classes in anatomy were given under her direction. As she recalls, "This meant three summers with 'classes as usual' before the days of air conditioning."

The postwar period was an important time in her career. Though she had attained tenure with her promotion to associate professor in 1930, she had remained at that rank for sixteen years. Today she believes that she could well have retired at that level had she not decided to discuss her promotion with Dr. E.V. Cowdry, then chairman of the department. She remembers that close friends and a colleague



thought it unwise to confront the problem. At her meeting with Cowdry, she asked him a characteristically straightforward question: "In what way am I deficient for promotion?" He replied, "Well, I'll have to see about getting a committee together to evaluate your accomplishments." The members of this review committee were Robert A. Moore, M.D., then Dean of the Medical School and Chairman of the Department of Pathology, Everts A. Graham, M.D., Chairman of the Department of Surgery, and Sherwood Moore, M.D., Chairman of the Department of Radiology. In 1946 they recommended her promotion to Professor of Gross Anatomy, making her the first woman to reach this rank at Washington University Medical School. The next woman to become a full professor was Dr. Gerty Cori in 1947, the year she won a Nobel prize.

In 1948, Trotter took a leave of absence, without salary, to work for the United States Army in Hawaii. After twenty-seven years of service in St. Louis, she was ready for a new challenge. At the 1948 meeting of the American Association of Physical Anthropologists she had learned of the military's acute need for an anthropologist with the expertise necessary to identify the remains of war dead in the Pacific zone. She made application for the position. Her qualifications were impeccable. Much of her research had dealt with the comparative and identifying characteristics of skeletons. After she attained the post, she learned that a two-day delay had been caused by her age and sex, "both of which had to be waived by a higher authority." Trotter's career had always been a challenge to preconceived ideas about woman's place.

Despite the grim responsibilities of her job, she enjoyed her stay in the Hawaiian Islands. She lived in the Nurses' Quarters at Schofield Barracks on Oahu. Always alert to research opportunities, she obtained permission (after six months of negotiation) from General Hull, Commander in Chief, U.S. Army, Pacific, to measure long limb bones of known war dead. She undertook this research in

addition to her primary responsibility for identifying the remains of the unknown. Her aim in collecting these data was to improve stature estimates made for Americans from the lengths of long limb bones. The best available equations had been based on data derived from fifty French cadavers in the 19th century. The decision to gather new data was a characteristic example of Trotter's ability to make the most of an available opportunity. Her research resulted in new formulae for the estimation of stature which are still used in forensic medicine. Using war dead for research was a new concept; Trotter's work was a breakthrough.

In 1949, the year she returned to St. Louis after fourteen months in Hawaii, Dr. Edward Dempsey was chosen to be the new chairman of the Department of Anatomy. Trotter's straightforward attitude quickly gained the respect of her new chief. "Dr. Dempsey and I had a good understanding of, and a healthy respect for, each other from the beginning of our association . . . he improved my salary when he learned that I worked hard and produced good results both in teaching and research." Dempsey also eliminated the adjective "gross" from her title, so that she became simply, "Professor of Anatomy." This seems a small change, but it had significance for Trotter; at last she was accepted as an anatomist in the same sense as her colleagues in the department.

During the 1950s and 60s, she began to gain national and international recognition for her work: honorary degrees from Western College for Women in 1956 and Mount Holyoke College in 1960. In 1956, she was the first woman to receive a Viking Fund Medal (given by the Wenner-Gren Foundation for Anthropological Research), preceding Dr. Margaret Mead in that honor. In 1963, Washington University Alumni Association gave her a Founder's Day Award. That same year she was asked to serve as a consultant to the Rockefeller Foundation and as Visiting Professor of Anatomy at Makerere Uni-

One of two Nobel laureates who studied under Mildred Trotter, Dr. Daniel Nathans, renewed acquaintances with his former teacher during his recent visit to Washington University.



versity College, Kampala, Uganda. There she helped prepare recent graduates for their primary F.R.C.S. examination.

These dual positions took her to Africa for six months during 1963. In addition to her work, she found time to be a tourist and has vivid memories of that experience. The most exciting moment was visiting the University of the Witwatersrand where Professor Raymond Dart gave her a special privilege: he allowed her to hold the skull of the "Taung's baby." This skull, found in the 1920s, had been a crucial link in reconstructing the history of early man. As she recalls, "Professor Dart took me to the inner sanctum of his office, unlocked with ceremony the cabinet which held one velvet-lined box, and lifted out the skull. He put it in my hands. Of course, he made certain that they were resting on a table so that there would be no chance of damage if I dropped it." Since much of her research had focussed on the significance of skeletal remains, holding this ancient skull (the center of spirited controversy among physical anthropologists) had deep meaning for Trotter.

1963 was also the year she was invited to give a lecture at Guy's Hospital, London, on "Race, Sex, and Age as Factors in Skeletal Variability." Nervous about this presentation, she was delighted when Maxwell Cowan (then on leave from Oxford) volunteered to help her draft the paper and rehearsed her in its presentation. Their association did not end with that occasion; five years later, Cowan came to Washington University School of Medicine as Chairman of the Department of Anatomy. His continued appreciation and support of her work have enriched her life in many ways.

1967 was Mildred Trotter's "retirement" year. She received the title of Professor Emeritus and Lecturer in the department which she had served for 47 years. Students and colleagues celebrated the occasion with gifts in her honor, including a commissioned portrait by her friend Aimee Schweig. Perhaps the most significant honor accorded her was the 1975 establishment of an annual named lectureship by the Washington University School of Medicine Alumni Association. She is the first woman to be so honored. As the program for the

first Trotter Lecture states, "In recognition of Dr. Trotter's deep concern for the role of women in academic life, the lectureship will be used to bring distinguished women scientists to the School of Medicine." The list of five Trotter Lecturers fulfills this charge:

1975-6 Mary Ellen Avery, M.D., Chairman, Department of Pediatrics, Harvard Medical School; "Pulmonary Surfactant: From Bench to Bedside."

1976-7 Beatrice Mintz, Ph.D., Senior Member, Institute for Cancer Research, Philadelphia; "Teratocarcinoma Cells as Probes of Differentiation and Malignancy."

1977-8 Rosalyn Yalow, Ph.D., Distinguished Service Professor and Nobel Laureate, Mt. Sinai School of Medicine of the City University of New York; "Perspectives in Radioimmunoassay."

1978-9 Elizabeth F. Neufeld, Ph.D., Chief, Section of Human Biochemical Genetics, National Institutes of Health; "Transport of Lysosomal Enzymes in Fibroblasts."

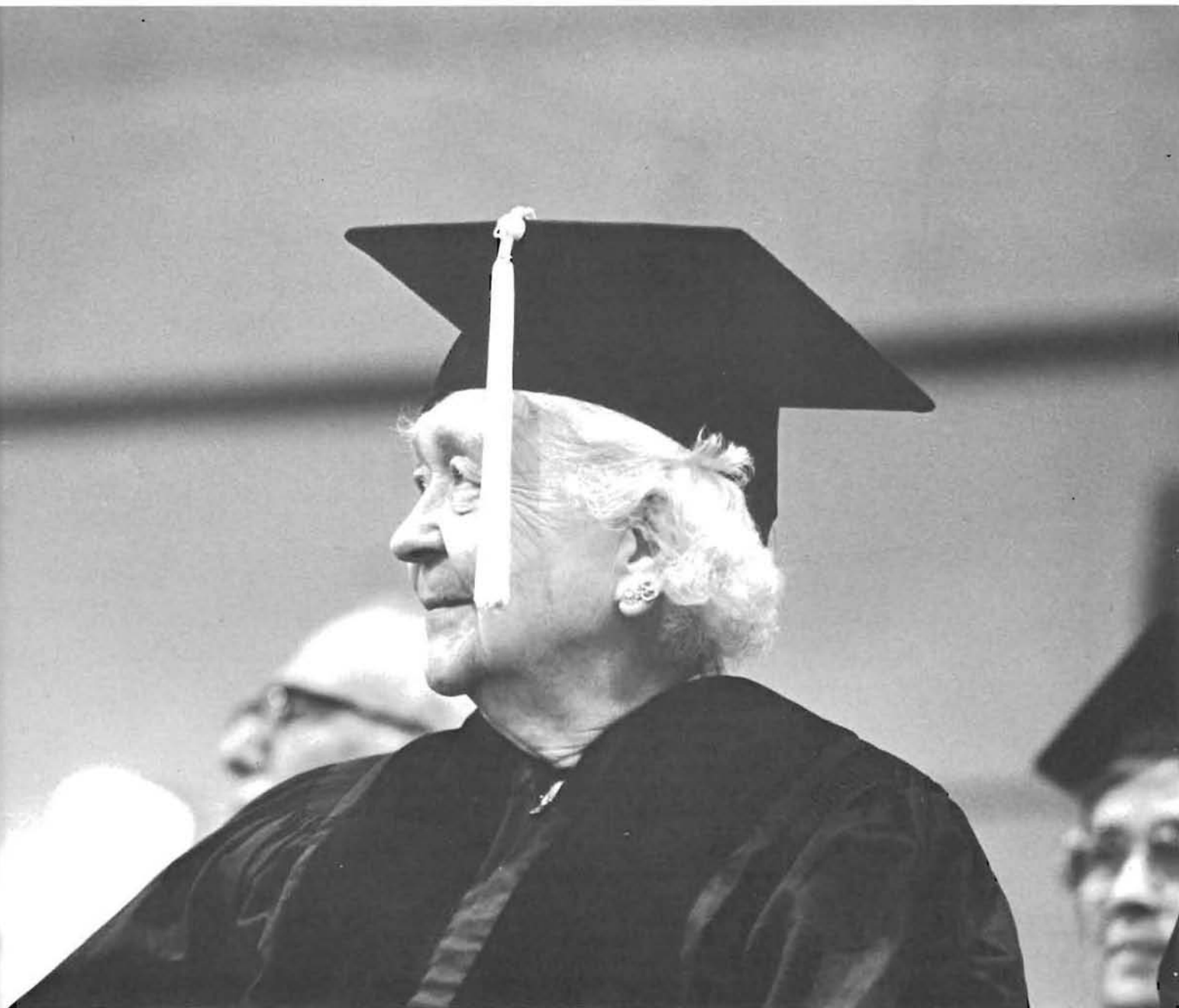
1979-80 Elizabeth D. Hay, M.D., Chairman, Department of Anatomy, Harvard Medical School; "Interaction of Epithelial Cell Surface and Extracellular Matrix During Corneal Development."

(It is of interest that Avery and Hay are the first two women to serve as heads of departments at Harvard Medical School — which did not decide to admit women as medical students until 1945.)

A number of other honors have come to Trotter since her retirement. In 1976, the American Association of Physical Anthropologists held a plenary session, as the Proceedings note, "in honor of her many contributions to the literature of physical anthropology as well as her many efforts on behalf of the Association." Speaking at the session, her close colleague, Professor Roy Peterson, remarked: "In reviewing the publications of Dr. Trotter, I was struck by the several themes, apparently unrelated yet interwoven, that form the fabric of her scientific record. It seems to me that this is more than a fabric; it is a tapestry, intricately woven with overlapping patterns of many hues. The overall theme can be characterized as the structure of man." Dr. Stanley Garn noted at the same session that "by providing hard data on skeletal weights and therefore adult bone loss, Trotter stimulated hundreds of investigations." In conclusion, he said, "I just remark again how much we may admire a scientist who began such an important series of contributions beyond the age at which most have settled into their laurels."

Though "laurels," including her honorary degree from Washington University this year, continue to be bestowed on her, Trotter still shows no sign of settling into them. The 4th floor office she has occupied since 1941 is still the site of much activity. Since her official retirement in 1967, she has published a dozen research papers. As Convener of the International Anatomical Nomenclature Subcommittee for Osteology, she engages in active correspondence with scholars in her field. An inveterate learner, this year she enrolled as a guest auditor in undergraduate courses on archaeology and human evolution.

Mary Bunge, professor of anatomy and neurobiology, said of her at the 1980 Trotter Lecture, "Trotter's standards have always been the highest . . . her interest in education never ceases . . ." By granting her an honorary degree this spring, the University gave formal recognition to her remarkable career. This tribute from the institution which has been her intellectual home for sixty years has special significance. In honoring her, the University has done honor to itself. ■



Dr. Mildred Trotter: teacher of 4,000 medical students; founding member and later president of the American Association of Physical Anthropologists; first woman to achieve the rank of professor at Washington University School of Medicine; first woman Viking Fund Medalist in physical anthropology; first woman at WUMS to be honored by an annual named lectureship sponsored by the Alumni Association. One of her research projects during World War II established formulae for estimating stature which are still used in forensic medicine. Her post-retirement research has stimulated hundreds of investigations into adult bone loss.

The West Pavilion: A Photo Tour

*by Casey Croy
Photos by Denny Silverstein*



The sleek and monolithic southern front of the Washington University Medical Center is the result of completion of the new Barnes Hospital West Pavilion. The 17-story West Pavilion adjoins the East Pavilion which was completed in 1973. The two buildings look like a single structure that stretches 460 feet along Barnes Hospital Plaza, from Queeny Tower on the west to the McMillan Hospital building on the east.

The West Pavilion project required no debt financing or government funds. The estate of the late Edgar and Ethel Queeny provided most of the financing, and the Barnes Hospital Auxiliary pledged \$1 million.

Ground was broken in July 1977 for the \$55 million project which included the new structure, four additional floors on the East Pavilion, and renovations to the Barnes and Rand-Johnson buildings.

Formal dedication ceremonies were held December 12, 1979, on the 65th anniversary of the first surgery at Barnes Hospital — an appendectomy on a young woman. The West Pavilion received its first patient, an Illinois woman, in January 1980.

The West Pavilion's first patient entered the cardiothoracic division, which occupies the entire second floor. The facility is unique in the magnitude of design decisions made by surgeons, anesthesiologists, nurses and technicians under the direction of Clarence S. Weldon, M.D., Washington University professor of surgery and chief of cardiothoracic surgery at Barnes. Weldon and his staff had three major goals for the new facilities — patient care, use of the best technology available, and improvement of staff development.

Eighteen pre-op beds, two anesthesia induction rooms, five operating rooms (three of which

are specifically designed for open-heart surgery), three recovery rooms and 22 post-op beds surround the 12-bed intensive care unit in the core of the building. The floor plan layout is based on the concept of integrated care of patients from admission to discharge. It eliminates the need to move patients long distances within the medical center.

The heart of the cardiothoracic unit is the horseshoe-shaped intensive care area. The 12 private rooms feature sliding glass walls opening to the nursing center. The rooms are equipped with the most advanced monitoring equipment.

The computer-controlled system monitors cardiac pressures, heart rate and electrocardiogram and displays the information on large television screens. Because the data display is video, information can be color coded. Alphanumeric data, such as the names of patients and surgeons and the types of operations, are also displayed on the screens. The screen in each room is visible from the central nursing desk. And, a nurse at the bedside of one patient can call up information about another patient and have it displayed on the screen in the room where he or she is working. The monitoring system was developed by Washington University.

Weldon began work with Washington University's Biomedical Computing Laboratories in 1973 to develop a better patient-monitoring system than was then commercially available. "Our labs built a prototype computer-controlled system for the four-bed ICU we were using at the time," Weldon explained. "We continued to study the system, and made some changes and refinements. Because of that study, we were prepared to ask our supplier, Midwest Analog, to build us a system with all of the features we had learned about."

Another aspect of patient-monitoring technology is the post-op area's telemetry system which broadcasts each patient's EKG to display stations in the halls and at the nursing desk. "We can monitor the condition of a patient who is walking around in the hallway," Weldon said.



Dr. Weldon



When the cardiothoracic floor is completed, it will have two waiting rooms (one especially for the families of patients undergoing surgery) and a teaching area. "We intend to develop a staff of nurses trained in the total care of the patient," Weldon said. "This training will integrate all phases of patient care — pre-op, surgical nursing, intensive care, and post-op nursing. This is critical for the future because the volume of heart surgery in the U.S. is steadily growing. This is becoming a very large specialty, and nurses will be more involved in care than surgeons, which was not the case several years ago when this was a much smaller specialty."

In 1968, when Weldon joined Washington University School of Medicine, fewer than 100 thoracic operations were performed at Barnes Hospital. Nearly 600 are projected for 1980-1981.

The second-floor cardiothoracic unit, along with the third-floor surgery center, the fifth-floor renal center and the patient rooms on the sixth floor were all open in time for the dedication ceremonies. Moving in to the rest of the 450,000 square feet of new facilities and the 150,000 square feet of renovated space, has been planned in phases throughout 1980. Construction, equipment installation and adjustment,

interior design and finishing work are in various stages of progress.

The terrace level, ground floor and first floor are scheduled to open soon. The terrace level adjoins two tunnels under Barnes Hospital Plaza to the subterranean parking garage. On the terrace level are a 110-seat amphitheatre, chronic dialysis and the Barnes Auxiliary's Nearly New Shop. The ground floor, or main entrance, houses waiting rooms, the pharmacy and an enlarged cardiac diagnostic laboratory. Admitting and related tests and x-ray procedures occupy most of the first floor.

The third floor is dedicated to surgery. Operating rooms have been designed and equipped especially for plastic surgery, kidney transplants, orthopedic pediatric and urologic surgery and general surgery. There are also five outpatient operating rooms, anesthesia and anesthesiology offices, and a 30-bed recovery room. A total of 31 new operating rooms are in the West Pavilion, some replacing older ORs in the Rand-Johnson building.

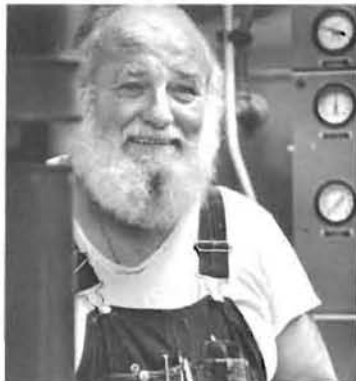
A six-bed burn unit with two metabolic rooms, house staff call rooms, surgical pathology and central service processing are on the fourth floor, which will open later this year.

Acute dialysis (six beds), the kidney transplant nursing division with 21 beds, a three-bed renal ICU and an 11-bed surgical ICU are on the fifth floor.

The sixth floor is occupied by private and semi-private patient rooms. The orthopedic nursing division, with a four-bed ICU, is on the seventh floor. An extremely sophisticated 10-bed respiratory ICU is on the eighth floor.

The ninth and tenth floors, owned by Mallinckrodt Institute of Radiology, house the depart-





ments of cardiovascular radiology and nuclear medicine, and the outpatient x-ray service.

The eleventh floor is reserved for future use, and the two-story twelfth floor houses mechanical equipment. The fourteenth and fifteenth floors will house five psychiatric nursing divisions, a two-story gymnasium for psychiatric patients, and the activity therapy department. The top two floors accommodate doctors' offices. A 56-foot long skywalk connects the sixteenth floor of the West Pavilion to the dining areas on the seventeenth floor of Queeny Tower.

Energy-efficient electrical and mechanical systems occupy not only the two-story twelfth floor, but also the basement and rooftop.

An Alpha 1000 computer system controls the pumps, fans, boilers, chillers and heat exchangers. Programmed with utility rate information, the computer selects electricity or gas for heating, and determines the amount of outside air taken in to the air conditioning and ventilation system. The computer determines how many boilers to operate, and monitors their efficiency. It also indicates equipment which is not operating properly and activates alarms if needed.

In the basement are two boilers capable of producing 44 million BTu, and air compressors, water softeners and the vacuum system. On the twelfth floor are other parts of the integrated system — chillers, pumps, heat exchangers, exhaust fans and huge air filters which are housed in an area nearly the size of a semi-private patient room.

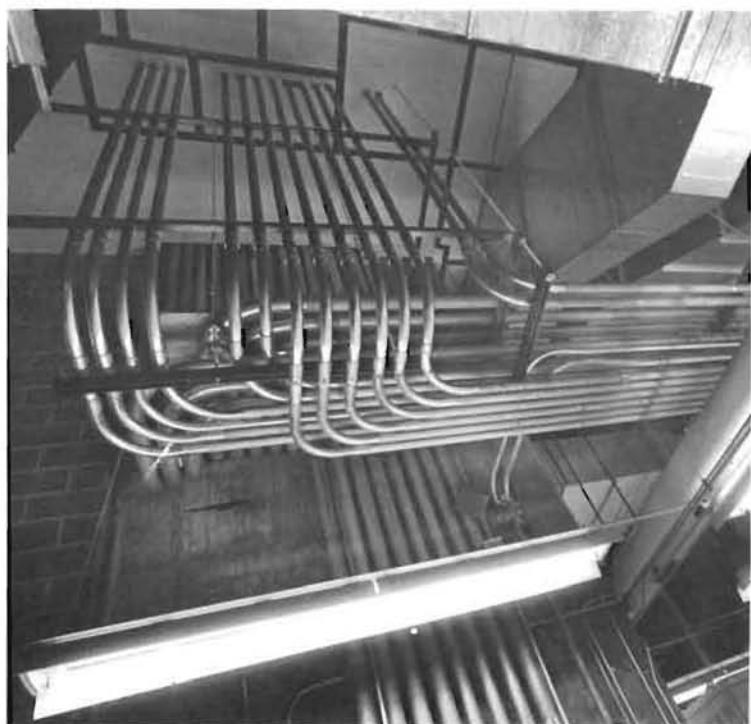
Six emergency diesel-fueled generator sets can provide all the electrical power required within a



split second of being automatically activated. They can provide power for several days, including pumping their own fuel up from ground-level storage tanks.

Electrical and mechanical installation has been in progress since the spring of 1978, and a total of two-and-one-half years will be required for completion and fine adjustments for all areas of the hospital.

Kenneth E. Wischmeyer & Partners served as architect for the West Pavilion. Consulting engineers were: Becker & Pannell, Inc., Crawford & Witte, Inc., Van & Viersé, and L.E. Heideman. General contractor was McCarthy Brothers Construction Company, and the major subcontractors were Sachs Electric Company and Murphy Company, mechanical contractors.



Electronic Teachers' Aides

by Casey Croy

Gone are the days of bringing an apple to the teacher. Today, the teachers are bringing Apples — electronic, not organic — to the students. Apple II microcomputers and their programmed seminars in the departments of surgery, medicine and psychiatry are growing in popularity and availability. One was recently added to the Learning Resources Center in the library.

According to John D. Halverson, M.D., assistant professor of surgery, computer-assisted instruction (CAI) has been evolving since the early 1960's when computer scientists and technicians at Massachusetts General Hospital, Ohio State University and UCLA were developing instructional programs in several disciplines. In the '60's, colleges and medical schools could buy time on large computers at institutions with time to sell. Terminals and computers were linked by special long-distance telephone lines.

"There were some problems," Halverson said. "Accessibility was limited. The datalink lines and computer time were expensive, and instruction lacked orientation to any specific curriculum. We used computers at Massachusetts General and Ohio State through the Health Education Network, but only for a few hours a month."

Halverson was brought to Washington University School of Medicine in 1974 by Walter F. Ballinger, M.D., professor of surgery, to develop a curriculum for computer-assisted instruction. "Dr. Ballinger and I wanted to orient CAI materials to our curriculum and to develop programs that would be attractive to students and, consequently, effective. The department was involved in experimental devel-

opment of a CAI system which would provide access to individualized core materials in general surgery, provide a semi-automatic system for the creation and use of CAI seminars, and be feasible for postgraduate continuing medical education."

M. Kenton King, M.D., dean of the School of Medicine, authorized purchase of two PDP 1140 mini-computers for clinical research and for development of CAI. Both were programmed in the MUMPS language (Massachusetts General Hospital Utility Multi-Program System). Simon Igielnick, Ph.D., joined the school to lead the development of the Medical Computing Facilities, designing systems to serve the entire medical school. "Simon was pivotal in designing the system to create the seminar lessons, to run them and to transfer them from the large PDP computers to discs for use on the microcomputers," Halverson said.

The key to the creation of the seminars was a series of programs designed to facilitate the writing, editing and use of CAI lessons regardless of the level of computer expertise on the part of authors or students. "We were defining the role of CAI and identifying opportunities for medical people to make a different kind of contribution than the computer specialists had made. They had been having some difficulties working in clinical disciplines. We knew we wanted a seminar approach — a student at the terminal, one-on-one with the professor who wrote the program," said Halverson. "We had to get a system in the computer first which would accept and process information, deliver responses to the user at either a simple or a sophisticated level, and decide on a remedial or advanced progression," he con-

tinued. With Igielnick's guidance, Halverson and his team set up a prototype system. "We were looking for a way to fund additional work when Milliken Communications Corporation, educational publishers, became interested and provided some funding and some expertise." More than 20 noted surgeons from across the country were invited to the school to discuss branch logic and formats which would help authors develop lessons. The surgeons later authored many of the seminars. Editorial refinements and technical formatting were carried out by Halverson, Ballinger and Kenneth Bennett, M.D., the editorial board.

"We strive to avoid paragraph forms. We want everything to be interactive. We want the system to demand that the student think of his or her own response and write it on the keyboard," Halverson said.

Typically, a lesson begins with a brief outline and statement of goals of the lesson. A background discussion follows, leading to a question requiring recall, inference or judgment. A correct response is reinforced by the computer, and then the student is presented with the next information in the sequence. If the student's response is partially correct or incomplete, the computer redirects the student, usually providing a clue or suggestion, or a review of materials. Positive reinforcement is built in, with statements such as: "Almost, but you're not exactly on the right track," or "That's good, but remember . . ." The computer then presents information that the student needs or did not relate properly to the situation. Vocabulary building is part of the approach. For example, if the student replies "erythema," the computer's answer is "Correct! Redness is

LET'S ASSUME A
A 3 CM, SMOOTH, RUB
RIGHT BREAST. HAVIN
----HOW WOULD YOU
>BIOPSY

MAYBE. ----BUT WHAT

>FROZEN SECTION

NO -- YOU'RE IN THE
----WHAT WOULD YOU

>ADMIT HER FOR IT

NO -- YOU'RE PREMATURE
OFFICE.

----WHAT COULD YOU

>MAMMOGRAM

A MAMMOGRAM IS PERMISSIBLE
I WAS IMPLYING THAT
----WHAT WOULD YOU

>NEEDLE IT

----DO YOU MEAN NEEDLE

>NEEDLE ASPIRATION

THIS IS TRUE IF YOU

IF THE ASPIRATION IS
NON-TENDER AND HARD, YOU
BUT LET'S ASSUME
RESIDUAL MASS IMMEDIATE
----WHAT WOULD YOU DO

YEAR OLD FEMALE COMES INTO YOUR OFFICE WITH
 A MASS IN THE UPPER, OUTER QUADRANT OF HER
 BREAST. YOU HAVE TAKEN HER HISTORY AND EXAMINED HER,
 AND YOU DECIDE TO PROCEED?-----

YOU THOUGHT THERE WAS FLUID IN IT?-----

OFFICE - A FROZEN SECTION IS NOT AVAILABLE.
 YOU DECIDE TO PROCEED?-----

YOU MIGHT BE ABLE TO HANDLE THIS IN THE
 NEXT WEEK?-----

RIGHT NOW?-----

BIOPSY IS AVAILABLE, BUT UNNECESSARY AT THIS POINT IN TIME.
 YOU DECIDE THE LESION WAS A CYST.
 YOU DECIDE TO ASPIRATE IT?-----

ASPIRATION OR NEEDLE BIOPSY?-----

THINK IT IS A CYST.

IF YOUR ASPIRATION WERE UNSUCCESSFUL, OR IF THE MASS IS IRREGULAR,
 YOU SHOULD PROCEED TO BIOPSY.
 IF YOUR ASPIRATION WAS SUCCESSFUL, AND THERE WAS NO
 RECURRENT MASS THEREAFTER.

another sign . . ." If the student's reply is colloquial, the computer's response is technical.

If a student's response indicates a fundamental misunderstanding, the computer branches to a remedial section to review more basic information. Once the student has correctly responded to remedial questions, the computer returns to the branch point and proceeds.

In the department of surgery, the first program was available in 1976. At the end of the 1980 school year, there were 25 computer seminars in use, and two Apple II microcomputers in the department's library.

In the department of medicine, 1980 was the first full year of operation, and 22 seminars, covering a wide range of topics, were available. Peter G. Tuteur, M.D., assistant professor of medicine in the pulmonary disease division, Allan Jaffe, M.D., assistant professor of medicine, and David M. Kipnis, M.D., Busch Professor of Medicine and chairman of the department, have led the development of the seminars. Faculty internists, and members of the faculties of other medical schools, were selected to write the seminars based on their reputations in medicine and their established skills as instructors in the seminar format. The hour-long seminars are designed for students and for practicing physicians who seek CME credits.

"The seminar method isn't the best way of learning for everybody," Tuteur said, "but for those who do learn well that way, we try to provide efficient, accessible, cost-effective seminar opportunities. At times of high demand, the department's Apple II units are placed in the medical school library where they are available after the department offices have closed for the day.

John Helzer, M.D., assistant professor of psychiatry, has coordinated a team which developed ten seminars in psychiatry. According to Kristen Carey, instructional programmer and editor of the programs, there are lessons of interest to physicians and students in general, and others of interest specifically to psychiatrists. Of general interest are: "Interviewing Patients With Emotional Complaints," "Alcoholism," "Depression," "Suicide" and "Sleep Disorders." More attuned to students of psychiatry are the lessons on "Tardive Dyskinesia," "Neuroleptic Drugs," "Electroconvulsive Therapy" and "Organic Brain Syndrome." Some of the programs were written by Helzer and by Ronald Martin, M.D., associate professor of psychiatry. Others were authored by faculty members from other medical schools. Editing and production coordination are the responsibilities of the department of psychiatry.

Initially, the computer-based programs were expected to be used primarily for CME credits. Students reviewed the lessons during the testing phase and found them to be useful and interesting. Students and residents studying for the boards regularly visit the library's Learning Resources Center to check out Apples and psychiatry seminars.

In all, more than 100 tutorial programs are available at the school, bringing students personalized, interactive lessons written by some of the best professors in American medical education. The work continues. As Peter Tuteur said, "All of education, from primary to continuing professional education, is seeking new, efficient and effective ways to acquire and disseminate information and skills. The cost of one-on-one teaching, in person, is prohibitive, and the cost of





the materials developed here, including schools in Libya, Saudi Arabia, Canada, Australia and Holland. This whole project is potentially very important to medical education. These seminars are interactive, a completely different medium from the textbook or the lecture. The computer-based seminar can have a tremendous impact on future physicians and on continuing medical education."

"New seminar subjects continue to be developed, and plans are being made for the future. Halverson is interested in the development of intricate case simulations, and so is Peter Tuteur.

"It is often impractical, and sometimes illegal and unethical, to allow students to manage the clinical situation, even with supervision," Tuteur said. "For example, one might want students to have skills in the management of patients with diabetic ketoacidosis. But students may never see such a patient. We can mimic the clinical situation with continuous feedback from the computer." Students would question the "patient" in their own words. For example: "You don't have chest pain?" Or "Tell me about your chest pain." Or "Have you ever in your whole life had any chest pain?" The computer would be programmed to respond according to the question, and also to evaluate the efficacy of the student's way of expressing the question. According to Tuteur, clinical simulation work is going on at Massachusetts General Hospital, Ohio State University, and through the American Board of Internal Medicine. The focus is on the problems of acquiring and managing subjective information, and evaluating skills, rather than teaching them. "It is important to remember," Tuteur said, "that

computer-based seminars and simulations are not a cure-all for problems in medical education. They will not replace clinical teaching. But, as a supplement to existing forms of didactic and practical education, they have certain advantages of cost and availability." And the students like the experience.

Halverson has collected student responses to course-evaluation questionnaires. Some of the reactions:

"I used 10 or 12 ... wish I had time to do them all."

"Very good, but not enough time to use properly ..."

"The ... format encourages active consideration of problems and increases subsequent recall."

"Good, when a machine is available."

"Good. Could use some on the subspecialties."

"A good idea, well written ... cover material well."

"Very helpful when available."

"Very good. Please continue and expand ..."

Computer-assisted instruction seems destined to become more popular and more widespread with the growing impetus toward relicensing and recertification requiring continuing medical education. "In regard to cost effectiveness, if you want to buy a large computer and put a system in your department, it could be very costly," Halverson said. Technological developments and intensifying competition in the computer industry have made microcomputers cost effective and affordable. They are being sold at the retail level in computer stores springing up in shopping centers around the country. Physicians in private practice are buying them, and a special publication, "Physicians Microcomputer Report,"

was established two years ago to serve the market. It has 5,000 paid subscribers. The magazine sent questionnaires to its subscribers. Of the nearly 10 percent responding, 65 percent reported owning their own microcomputers. More than half know the rudiments of programming, and more than a fourth of them have access to larger or mainframe computers.

Nearly 60 percent would like to access large medical data bases from home or office. Of a list of 25 professional applications of microcomputers, CAI ranked seventh. (Billing, accounting, medical records and other office-related applications led the list.) Of a list of 12 personal-use categories, computer education ranked fifth. However, buying "software," or programs which control the computer and make it respond to other machines and to people is, in the long run, more expensive than the initial investment in the microcomputer.

Medical schools have turned to networks to share programs and cut costs. Washington University has been providing both undergraduate and postgraduate curricula to the national Health Education Network. Students at participating schools can benefit from instruction by faculties throughout the country.

Microprocessors are becoming common, everyday tools. Programs are available to operate kitchen appliances, transcribe music for song writers, and play games for general amusement, as well as keep records and provide education. Educators working on CAI in medical schools are not only teaching medicine, they are introducing students to tools that will become increasingly important in all aspects of their professional and personal lives. ■

hard-copy materials such as books is constantly increasing. In the search for new methods, the computer is being exploited."

The computer-based seminars developed by Washington University School of Medicine have been translated into several languages and are being marketed by Milliken throughout the world to medical schools and hospitals. According to John Halverson, "About two dozen schools use

Match Day '80



Before the results were made public, anxiety reigned.

John Vavra, M.D., assistant dean of the School of Medicine, spoke briefly to the students about the results of matching.



John Vavra, M.D., assistant dean of the School of Medicine reported that 54% of the students in the class of 1980 were matched with their first choice for residencies. Eighteen percent matched with their second choice, and nine percent with their third choice. Two students chose not to take a residency in 1980. A total of 51 students will take residencies in internal medicine, and 30 are going into surgery. Other residencies and the number of students in each are as follows:

Pediatrics	10
Flexible	9
Family Practice	8
OB/GYN	8
Pathology	8
Radiology	7
Orthopedic Surgery	3

The fields of anesthesiology, microbiology, neurobiology, neurological surgery and psychiatry each attracted one student. Match Day '80 results by state are as follows:

Alabama
Birmingham
 University of Alabama Medical Center
 Matthew S. Bodner, Anesthesiology

Arizona
Phoenix
 Good Samaritan Hospital
 Karen Lewis, Flexible

Tucson
 Tucson Hospitals
 Kim D. Burroughs, Flexible
 University of Arizona Medical Center
 James M. Nachbar, Surgery

California
Davis
 University of California Affiliated Hospitals
 Fred A. Norman, Family Practice

Irvine
 University of California Affiliated Hospitals
 Gregory J. Allen, Radiology
 Vance O. Gardner, Surgery
 Howard K. Steinman, Internal Medicine

Los Angeles
 Children's Hospital
 David A. Ferry, Pediatrics
 William S. Morgan, Pediatrics
 University of California Hospitals
 Gary A. Press, Surgery
 University of Southern California Medical Center
 Alan S. Edelman, Neurological Surgery

Riverside
 Riverside General Hospital
 Teddy F. Bader, Family Practice

San Diego
 Mercy Hospital
 Michael B. Shapiro, Flexible
 Steven A. Smith, Flexible
 U.S. Naval Medical Center
 Herbert E. Bevan, Pediatrics
 University Hospital
 Robert A. Cooper, Internal Medicine

San Francisco
 San Francisco General Hospital
 Gwendolyn A. Fyfe, Flexible
 Mark H. Spurrier, Flexible

Stanford
 Stanford University Hospital
 Janice M. Lage, Pathology
 Steven D. Mark, Pathology

Torrance
 UCLA Medical Center
 John H. Kuwata, Internal Medicine
 Richard Rath, Internal Medicine
 W. Grant Stevens, Surgery
 Travis Air Force Base
 Irving C. Hudlin, Surgery

Colorado
Denver
 St. Josephs Hospital
 Darrell D. Walter, Internal Medicine

Connecticut
New Haven
 Yale-New Haven Medical Center
 Pamela R. Edmonds, Pathology
 Mary G. Gregg, Surgery
 Vincent J. Quagliarello, Internal Medicine

Florida
Gainesville
 William Shands Hospital
 Elizabeth L. Engelhardt, Pediatrics
 John R. Meuleman, Internal Medicine
 Alan D. Siegel, Internal Medicine
 Fergus P. Thornton, Internal Medicine

Miami
 University of Miami Affiliated Hospitals
 Harry C. Blair, Pathology
 Harry Dinerman, Internal Medicine

Illinois
Chicago
 McGaw Medical Center
 Joel S. Finkelstein, Internal Medicine
 Michael Reese Hospital
 John C. Butler, Internal Medicine
 Mark Konwiser, Internal Medicine
 Presbyterian-St. Luke's Hospital
 Roy R. Auer, Radiology
 University of Chicago Clinics
 Howard A. Levite, Internal Medicine
 University of Illinois Hospitals
 Claire S. Neely, Pediatrics

Maywood
 Loyola University Affiliated Hospitals
 Robert C. Morris, Surgery

Indiana
Indianapolis
 Indiana University Medical Center
 Bernard F. King, Internal Medicine

Iowa
Iowa City
 University of Iowa Hospitals
 Robert J. Raish, Internal Medicine

Louisiana
New Orleans
 Charity Hospital, L.S.U. Service
 James M. Poindexter, Surgery

Maryland
Baltimore
 Johns Hopkins Hospital
 Bert R. Mandelbaum, Surgery

Massachusetts
Boston
 Boston University Affiliated Hospitals
 Charles J. Eaton, Surgery
 Harvard University School of Medicine
 Jeff W. Lichtman, Neurobiology
 Massachusetts General Hospital
 Ellen Li, Internal Medicine
 Ray L. Watts, Internal Medicine

Cambridge
 Cambridge Hospital
 Steven T. Lacy, Internal Medicine

Michigan
Ann Arbor
 University of Michigan Affiliated Hospitals
 Michael Choy, Pediatrics

Minnesota
Minneapolis
 University of Minnesota Hospitals
 Steve E. Calvin, Obstetrics and Gynecology
 Carl W. Ludvigsen, Pathology

St. Paul
 St. Paul-Ramsey Hospital
 Joel P. Jahraus, Family Practice

Missouri
St. Louis
 Barnes Hospital
 Maria A. Caras, Internal Medicine
 Devoree A. Clifton, Pathology
 Silvia S. Fojo, Internal Medicine



The nervous hush in Corri Auditorium was short-lived as more than half of the students learned that they matched to their first choice for residencies.

Robin L. Heise, Obstetrics and Gynecology
 Faith H. Holcombe, Internal Medicine
 Donald A. Kennerly, Internal Medicine
 Paul B. Kilzer, Pathology
 David G. Mutch, Obstetrics and Gynecology
 Darryl H. Nash, Obstetrics and Gynecology
 Lisa B. Ring, Obstetrics and Gynecology
 John G. Saint, Obstetrics and Gynecology
 Robert J. Saltman, Internal Medicine
 James A. Shayman, Internal Medicine
 Rand W. Sommer, Internal Medicine
 Jeffrey P. Tillinghast, Internal Medicine
 Kenneth J. Winters, Internal Medicine
 Andrew A. Wolff, Internal Medicine
 The Jewish Hospital of St. Louis
 Thomas A. Aronson, Internal Medicine
 Edward M. Draper, Surgery
 Timothy J. Dyches, Surgery
 James W. Fleshman, Surgery
 Joel A. Goebel, Surgery
 Joseph H. Graboyes, Surgery
 Gwenn K. Pavlovitz, Surgery
 James L. Salzer, Internal Medicine
 Maxine C. Tabas-Myers, Internal Medicine
 St. John's Mercy Hospital
 Steven B. Perlmutter, Flexible
 R. Keith Rothberg, Flexible
 St. Louis Children's Hospital
 Bruce K. Duemler, Pediatrics
 Shirley M. Knight, Pediatrics
 Kevin R. Kowaleski, Pediatrics
 Thomas C. McKinney, Pediatrics
 St. Luke's Hospital
 Sandra L. Knoll, Internal Medicine
 Daniel W. Whitehead, Internal Medicine
 Washington University Affiliated Hospitals

Steven J. Adler, Radiology
 Samuel E. George, Microbiology
 Roland B. Hawkins, Radiology
 Donna A. Kono, Surgery
 Jeffrey B. Kramer, Surgery
 Robert W. Laakman, Radiology
 Edward F. Schlafly, Surgery
 Ellis R. Taylor, Surgery
 John Williams, Psychiatry

New Hampshire

Hanover

Dartmouth-Hitchcock Center
 B. Anne Lovejoy, Internal Medicine

New Mexico

Albuquerque

Patrick Gerstenberger, Internal Medicine

New York

New York

Montefiore Hospital Center
 Vicki J. Levine, Internal Medicine

The New York Hospital
 John R. Cutler, Internal Medicine

New York University Medical Center
 Thomas W. Loeb, Surgery

Presbyterian Hospital
 Dan R. Littman, Pathology

Rochester

Strong Memorial Hospital
 Michael L. Dvorkin, Surgery
 Brian E. Laux, Internal Medicine

Syracuse

SUNY, Upstate Medical Center
 Seth M. Pransky, Surgery

North Carolina

Durham

Duke University Medical Center
 Dennis P. Devito, Orthopedic Surgery
 John A. Spratt, Surgery

Ohio

Cleveland

Case Western Reserve University Hospital
 Joyce A. Albi, Obstetrics and Gynecology

Cleveland Metropolitan General Hospital
 Rodney W. Brooks, Internal Medicine
 University Hospitals of Cleveland
 Mark I. Aeder, Surgery

Columbus

Ohio State University Hospitals
 George J. Haladay, Surgery

Toledo

Medical College of Ohio Affiliated Hospitals
 Randall T. Loder, Orthopedic Surgery

Pennsylvania

Philadelphia

Hospital of the University of Pennsylvania
 Robert C. Fried, Surgery
 Rachel B. Sorokin, Internal Medicine

South Carolina

Columbia

Richland Memorial Hospital
 D. Scott Grubbs, Family Practice

Texas

Dallas

Baylor University Medical Center
 Jefferson D. Cox, Radiology
 Kevin R. Wheelan, Internal Medicine

University of Texas Affiliated Hospitals

Stephen J. Sanofsky, Surgery
 Bruce S. Schlafly, Orthopedic Surgery

University of Texas SW Affiliated Hospitals

David D. Chaplin, Internal Medicine
 Randall L. Miller, Surgery
 Fred J. Thaler, Internal Medicine

Houston

Baylor College Affiliated Hospitals
 Daniel Phillips, Internal Medicine
 Charles R. Prince, Internal Medicine

San Antonio

San Antonio Teaching Hospital
 Bruce D. Akright, Obstetrics and Gynecology
 Laura S. Akright, Internal Medicine

Utah

Salt Lake City

University of Utah Affiliated Hospitals
 Mark S. Ibsen, Family Practice
 Thomas E. Nickol, Family Practice

Virginia

Richmond

Medical College of Virginia
 Patricia E. Bell, Internal Medicine
 Jeffrey L. Schul, Internal Medicine

Washington

Seattle

Providence Medical Center
 Michael P. Kappelman, Family Practice
 University of Washington Affiliated Hospitals
 Steven McGee, Internal Medicine

Tacoma

Tacoma Family Medicine,
 Allenmore Medical Center
 Cynthia Wilson, Family Practice

Washington, D.C.

Georgetown University Hospital
 Wayne T. Panullo, Internal Medicine

Wisconsin

Milwaukee

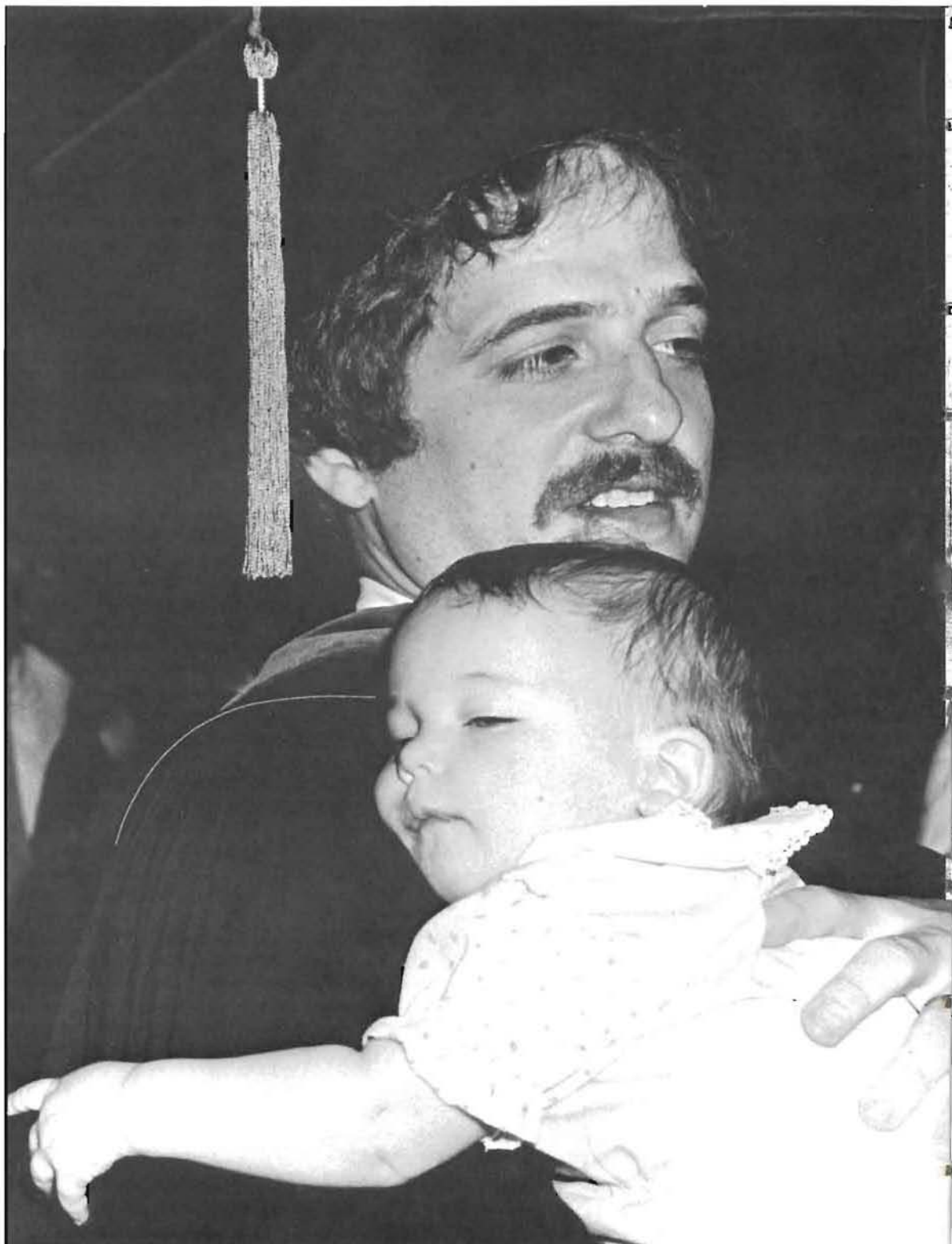
Medical College of Wisconsin Affiliated Hospitals
 Elizabeth A. Droege, Surgery
 David L. Olson, Radiology
 St. Joseph's Hospital
 Robert S. Grosserode, Flexible

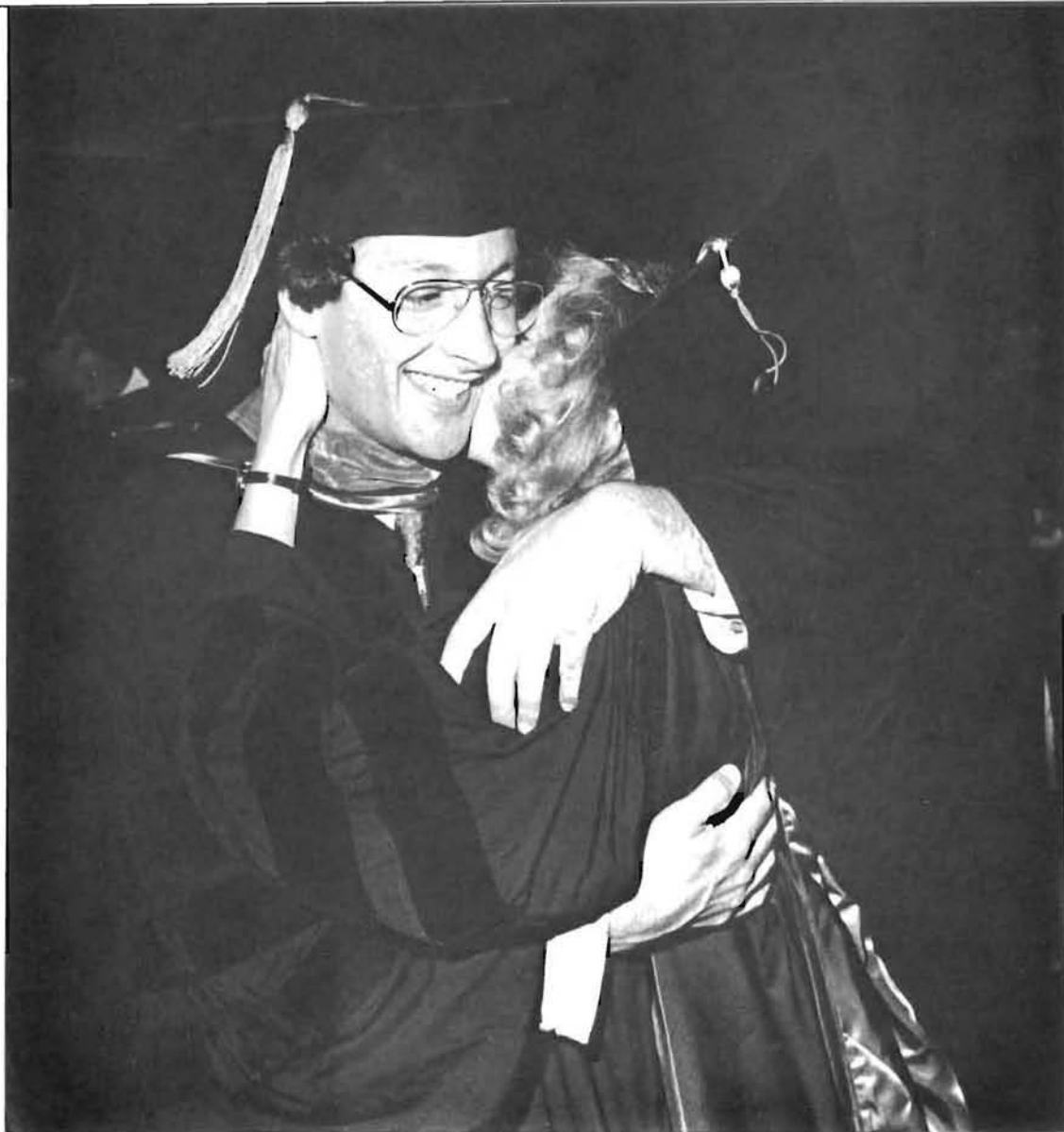
Graduation '80

Described by commencement speaker W. Maxwell Cowan, Ph.D., (Edison Professor of Neurobiology, professor and Head of the Department of Anatomy and Neurobiology) as "the largest class to graduate from the School of Medicine in its long history, and probably the best trained, both scientifically and clinically," the class of 1980, 140 strong, received Doctor of Medicine degrees on May 16 at the Cervantes Convention Center in downtown St. Louis.

Thirty-two members of the class received academic honors and 24 were elected to Alpha Omega Alpha. Eight were awarded both the Doctor of Medicine and the Doctor of Philosophy degrees: David Chaplin, Donald Kennerly, Brian Laux, Ellen Li, Jeff Lichtman, Dan Littman, Carl Ludvigsen, Jr., and James Salzer.

After attending graduation ceremonies on the main campus, the School of Medicine's graduating class enjoyed luncheon at the Cervantes Convention Center with their families and other guests. Diplomas were awarded by M. Kenton King, M.D., Dean of the School of Medicine, and Samuel B. Guze, M.D., Vice Chancellor of Medical Affairs.





"... my plea to you is that, even if you forget most of what we have tried to teach you . . . , you hold fast to three things which have always been the hallmarks of our finest graduates. They are: integrity, caring and conscientiousness . . ."

—W. Maxwell Cowan in his address to the class of 1980



Senior Awards 1980

Alpha Omega Alpha Book Prize Ray Lannom Watts
 American Medical Women's Association, Inc.,
 Scholarship Achievement Citations Maria Alexandra Caras
 Pamela Ruth Edmonds
 Sylvia Santamarina Fojo
 Robin Lee Heise
 Ellen Li
 Bette Anne Lovejoy
 Rachel Bernice Sorokin

 Alexander Berg Prize in Microbiology
 and Immunology Dan Rudolf Littman
 The Jacques J. Bronfenbrenner Award Mary Grace Gregg
 Richard S. Brookings Medical
 School Award Robert Carey Fried
 Robert Carter Medical School Award Steven Barry Perlmutter
 George F. Gill Prize in Pediatrics Herbert Everett Bevan III
 Alfred Goldman Book Prize in
 Diseases of the Chest Mark Stephen Ibsen
 Henry J. Kaiser Family Foundation/
 National Medical Fellowships
 Merit Award Shirley Mae Knight
 John E. Kirk Scholastic Award Ellen Li
 Louis and Dorothy Kovitz
 Senior Prize in Surgery William Grant Stevens
 Lange Medical Publications Book Awards Dennis Peter Devito
 Pamela Ruth Edmonds

 Irwin Levy Prize in Neurology and
 Neurological Surgery Ray Lannom Watts
 Edward Massie Prize for Excellence
 in Cardiology James Alan Shayman
 Medical Fund Society Prize in Medicine Jeffrey Paul Tillinghast
 Medical Fund Society Prize in Surgery Donna Aiko Kono
 Merck Manual Awards Maria Alexandra Caras
 Janice Marie Lage
 Robert John Raish

 Missouri State Medical Association Award Steven Roy McGee
 C.V. Mosby Book Awards David Dunbar Chaplin
 Sylvia Santamarina Fojo
 John Hiroshi Kuwata



Charles Eaton, M.D., president of the class of 1980.

St. Louis Internists Club Award Donald Alan Kennerly
 St. Louis Pediatric Society Prizes Shirley Mae Knight
 Andrew Aloysius Wolff
 Sandoz Award in Psychiatry John Williams
 Sidney I. Schwab Prize in Psychiatry John Hiroshi Kuwata
 Samuel D. Soule Award in
 Obstetrics and Gynecology Robin Lee Heise
 Upjohn Achievement Award Robert Jon Saltman
 Samson F. Wennerman Prize in Surgery Randall Lee Miller
 Hugh M. Wilson Award in Radiology David Gardner Mutch
 James Henry Yalem Prize
 in Dermatology Maxine Claire Tabas-Myers
 Alpha Omega Alpha Initiates Maria Alexandra Caras
 David Dunbar Chaplin
 Jefferson Dee Cox
 Pamela Ruth Edmonds
 David Scott Grubbs
 Robin Lee Heise
 Michael Porter Kappelman
 Donald Alan Kennerly
 Paul Bernard Kilzer
 Jeffrey Bruce Kramer
 Robert William Laakman
 Ellen Li
 Dan Rudolf Littman
 Randall Thomas Loder
 Bette Anne Lovejoy
 Steven David Mark
 Steven Roy McGee
 Vincent James Quagliarello
 Robert John Raish
 James Alan Shayman
 Rand Washburn Sommer
 Rachel Bernice Sorokin
 Jeffery Paul Tillinghast
 Ray Lannom Watts



W. Maxwell Cowan, Ph.D., commencement speaker: "... because I shall be leaving what has been my intellectual home for the past 12 years, ... I appreciate the invitation to address you on this auspicious occasion ... a critical moment of transition from being medical students to becoming lifelong students of medicine in all its varied forms."



Samuel B. Guze, M.D., Washington University Vice Chancellor for Medical Affairs, Spencer T. Olin Professor and Head of the Department of Psychiatry, and president of the Washington University Medical Center.



*At Left
Twenty-four members of the class
were accepted into Alpha Omega
Alpha.*

*At Right
Recipients of academic honors*



*Left
M. Kenton King, M.D., Dean of the
School of Medicine*

*Right
Thomas B. Ferguson, M.D., clinical
professor of surgery, and Roy R.
Peterson, Ph.D., professor of
anatomy and neurobiology, were
honored by the class as teachers of
the year. Also honored as teacher
of the year was James P. Keating,
M.D., professor of pediatrics, who
was unable to attend commence-
ment ceremonies.*



E. James Anthony, M.D., Blanche F. Ittleson Professor of Child Psychiatry and Director of the William Greenleaf Eliot Division of Child Psychiatry, was elected to the position of president-elect of the American Academy of Child Psychiatry. He will become president in 1981.

Bernard Becker, M.D., professor and head of the Department of Ophthalmology, received the Procter Award at the annual meeting of the Association for Research in Vision, held in May. He was honored for his research in glaucoma and diabetes, and for his contributions to the diagnosis and treatment of these diseases.

William R. Fair, M.D., professor and acting head of the Department of Surgery, was presented the Hugh Hampton Young Award by the American Urological Association at its 75th annual meeting in May in San Francisco. The award, named in honor of the founder and first editor of the "Journal of Urology," has been presented annually since 1969 to individuals who have made outstanding contributions to the study of diseases of the urinary tract.

Dov Kadmond, M.D., resident in urology, was presented with a Research Scholar Award by the American Urological Association. Four young urologists received awards to encourage their development of scientific capabilities in urologic research.

Philip W. Majerus, M.D., professor in the departments of biological chemistry and medicine, is president-elect of the American Society for Clinical Investigation. Majerus was elected at the society's 71st annual meeting, in May, in Washington, D.C. Majerus is director of the hematology division, principal investigator and director of the Specialized Center for Research in Thrombosis. He received his M.D. degree from Washington University School of Medicine in 1961.

Joshua Sanes, M.D., assistant professor of physiology and biophysics, is one of 78 young scientists selected this year to receive two-year basic research fellowships from the Alfred P. Sloan Foundation. Sanes specializes in neurobiology and will use his Sloan Fellowship funding for research into the influences of the molecular structure of the basal lamina on the pattern of nerve impulses transmitted to muscles. The Sloan Fellowships for Basic Research is a 25-year-old program established to encourage scientists under the age of 32 who are faculty members of colleges and universities in the U.S. and Canada, and who work in chemistry, physics, mathematics or neuroscience.

G. Michael Timpe, formerly director of financial analysis, has been appointed assistant dean, assistant vice chancellor for medical affairs and chief financial officer for the School of Medicine. Timpe replaces Hugh Morrison who has become president of the Medical Care Group of St. Louis. Timpe is a certified public accountant and holds a masters degree in business administration.

Peter G. Tuteur, M.D., assistant professor of medicine, has been named "Young Internist of the Year" by the American Society of Internal Medicine (ASIM). ASIM is composed of 51 societies representing 17,000 internists throughout the country. Tuteur was honored at the society's 24th annual meeting in May, in Washington, D.C., for his clinical and academic contributions to the field of medical socio-economics, including his innovative design of an introductory course in clinical medicine.

The Alumni Report

1980 Clinical Conference Ixtapa, Mexico

On January 26th approximately one hundred sun-and-warmth-hungry persons flew from various home bases to Ixtapa, the site of the Washington University Annual Clinical Conference. The states of Missouri and Illinois, Texas, Michigan, North Carolina, Wisconsin, Indiana, Minnesota, Virginia, West Virginia, Oklahoma, Nebraska, Alabama, and California were represented.

The Alumni's Claire MacConnell, together with Group Travel's Joanie Smith and Betty French, coordinated well.

From St. Louis the Texas International DC 9 took off smoothly on schedule considering the probable excessive volume of Pepto Bismol, Doxycyclene, and various other remedies designed to thwart "Tourista."

In flight from St. Louis a slight,

pleasant, miscalculation became apparent. The commissary had prepared turkey sandwiches for about forty persons; 80-plus were aboard. Result was "drinks on the house." Peanuts were plentiful, but I did not hear one Presidential joke.

Surprisingly, going through customs in Mexico was smooth. Joanie did such a great job guiding us through that hers was



The Author: Dick Huck



Sunset in Ixtapa

Medical Center
Alumni Association

660 S. Euclid
St. Louis, MO 63110
(314) 454-2823

Claire MacConnell, Director
Ruth Moenster
LaVerne Kammer

The alumni office is located in
room 107 of Wohl Hospital



Scientific Session



Fashion Show

the only luggage searched. No problem.

The flight on Aero Mexico to Zihuatanejo required about one hour. This time no peanuts, but the chocolate cookies were delicious.

The twenty minute ride from sparkling clean Zihuatanejo Airport was remarkable in that the weather was ideal — warm, dry, and calm. This continued so. We were greeted with Marguerita cocktails and effortless pre-registration at the El Presidente Hotel. Again good support. The accommodations were definitely adequate. The absence of drawers in the rooms did not seem to bother anyone. Swimsuits and laundry hung over balcony railings.

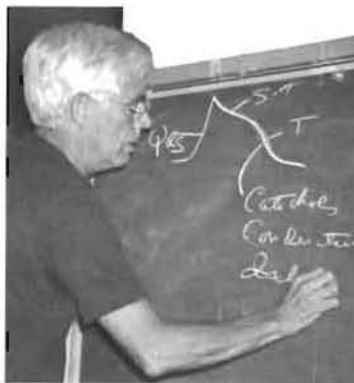
Despite the geographical distractions, the lectures were well attended. By design or otherwise, the opening lecture included the irritable bowel syndrome.

Dick Aach, Bob Drews, Phil Needleman, Horacio Jinich, Bob Paine and Paul Weeks delivered interesting, informative, and useful material during the morning hours assigned. As usual, Elmer Brown brought together an enthusiastic, knowledgeable faculty.

The Monday evening buffet was superb, as was the Mexican dinner Wednesday evening. Despite the Margaritas, Tequila, etc., nobody seemed to be tripping over their respective livers.

Some of us, quartered on the north side of the hotel, had a 5:30 a.m. treat during the week. The neighboring hotel staff rattled empty oil drums. If they were dumping trash, their sense of timing was diabolic.

Zihuatanejo is a picturesque coastal town, with many shops, much silver, and many fishing



Faculty Member: Bob Paine



Coffee Break



Faculty: Paul Weeks, Bob Drews, Phil Needleman



Bob and Doty Lovgren

Caroline and Augie Geise receiving tennis trophies from President Bob Drews



opportunities, and several excellent restaurants.

At our banquet Friday evening, Bruce and Margie Snider won the tennis tournament. President-elect Augie Geise and his wife, Caroline, were runners-up. Dick Myers won the golf tournament. Dick Carlin received honorable mention in the golf match for the most accurate score, as the story is told. Toni Laker from Ft. Wayne, Ind. was the leading woman golfer. Dolly Huck was runner up. President Bob Drews presented the "longevity award" to Dorothy and John Ubben. They have never missed a W.U. trip.

Sunday morning, half of our group returned to their respective homes probably relaxed, definitely tanned, hopefully ready to experience reality.

For the group participating in the optional three-day tour of



Dick and Janet Aach, Paul and Doris Weeks



Jim and Marcia Foerster, Sue and Bob Schultz



Toni Laker accepting golf trophy



John and Dorothy Ubben receiving "Longevity Award"



John and Ginny Porterfield

Mexico City, the weather was cooler, the air thinner, and definitely more breezy at night. The Fiesta Palace was a most comfortable hotel, but the plumbing failed in one of our party's rooms. Nobody drowned or died of thirst. Another room was obtained, thanks to Syd Wright.

Sergio, Otto, and Roberto, our guides, gave instructive commentaries about Mexican heritage including the Shrine and the Pyramids. Their jokes were also appropriate. They were with us at the National Palace to describe Diego Rivera's murals, and attended the magnificent Folklorico Ballet.

This trip was a relaxed, informative flight from winter. Probably we were overstocked with Pepto Bismol and peanuts.

Augie Geise's cruise next year should be great fun . . . hope you'll all be there.

Dick Huck, M.D. '48



Bill Vineyard, Bob Huckstep, B.C. Clyne



Ann Fallon, Dolly Huck, Joan Miller



Syd and Win Wright, Margie and Bruce Snider

Bob and Lorene Drews, Phil Needleman, Bob and Jane Paine, LeVerne and George Smith, Elmer Brown



Bob Schultz and Augie Geise



The Lindleys: Lucille, E.C., E.H., Perle



They also serve who only stand and wait.



Of Truth, Fiction and Strangeness

Science-fiction archfiend, Darth Vader, of "Star Wars" fame, did his evil deeds in far-flung and far-fetched galaxies. He looked like a brother of the critter above, a lowly roach known as *Blaberus giganteus*. The photo is by Paul Phillip Sher, M.D. '65, whose photography has appeared in magazines such as "National Geographic World," "Natural History," and "Camera 35."

OUTLOOK invites alumni to submit photos, drawings or other artwork for use in the publication. Please write or call the editor for information.

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