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OUTLOOK MAGAZINE

Washington University School of Medicine

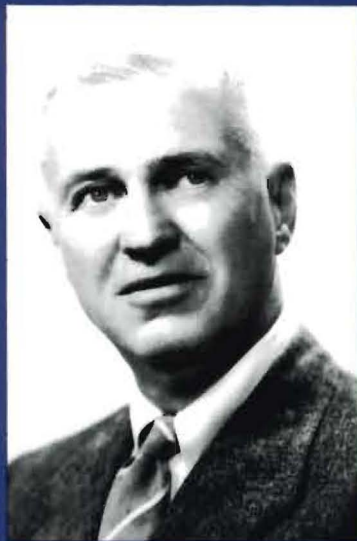
Spring 1983

INTERFERON:
FROM SCI FI
TO BLACK BAG

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The late Edmund V. Cowdry, from 1918 until 1921, was head of anatomy at Peking Union Medical College in China. He maintained a lifelong association with the China Medical Board. He joined Washington U. School of Medicine in 1928 as head of the cytology division in the anatomy department. He became head of the anatomy department in 1941, directed research at Barnard Free Skin and Cancer Hospital and at the Wernse Cancer Research Laboratory at WUMS. A major figure in the history of Washington U. School of Medicine, Cowdry died in 1975. "Bandits, Bodies & Bones," which begins on page 14, traces the interrelationships between Washington U. School of Medicine and China's Peking Union Medical College.

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Volume XX, Number 1

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Photo Credits:
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Spring 1983
Volume XX, Number 1
Outlook Magazine (ISSN0195-0487)
is published quarterly by the
Washington University School of
Medicine at 660 S. Euclid, St. Louis,
MO 63110. Second-class postage
paid at St. Louis, MO. Typesetting by
Just Your Type, Inc. Printed by
Universal. Direct alumni news and
all other communications to the
editor, Outlook Magazine, WUMS,
660 S. Euclid, St. Louis, MO 63110.

Side by Side in Treatment and Research

by Casey Croy

Theirs is a strange and wonderful relationship — the diabetologist who used to forecast weather in Iran, and the pathologist; the clinician, and the professor; the drum-beating fund-raiser, and the scholar behind the electronmicroscope in the lab.

That description could imply an aggregate of half a dozen people but, in fact, applies only to two. The two wear enough hats to put the milliner on overtime.

The diabetologist in private practice and the public eye in

St. Louis is Charles Kilo, M.D. '59. The pathology professor is Joseph R. Williamson, M.D. '58. Although the two had been in medical school at the same time (1956 through 1958), it took a combination of some doubts about a scientific study, and pathology department head Paul Lacy, M.D., Ph.D., to bring them together. And then, a little later, it took bolder action to forge and temper their partnership.

After his graduation from Washington U. School of Medicine in 1958, Williamson was a

pathology intern at Barnes Hospital and an NCI trainee in experimental pathology at the school. He continued at Barnes and the school as resident and trainee, published his first paper, "Electron microscopy of islet cells in alloxan-treated rabbits," with Lacy in 1959. In 1960–1961, he was co-chief resident in pathology and assistant in surgical pathology. He was a research fellow at Harvard's Joslin Clinic in 1962–1963, and assistant professor at WUMS beginning in 1962.

Kilo, after graduation in 1959, served his internship and residency at St. Luke's Hospital in St. Louis, took a fellowship in preventive medicine and endocrinology at Barnes Hospital, and then became chief resident back at St. Luke's until 1963. He subsequently went into private practice in endocrinology and diabetes.

While Kilo was treating diabetic patients and keeping abreast of the scientific literature in the mid-1960s, Williamson was conducting research and publishing papers, such as "The effects of glucagon and insulin on the isolated perfused rat liver." Because of his education and training at WUMS, Kilo was one of a minority of physicians whose goal in treating diabetics was (and still is) returning blood sugar levels to normal and keeping them as near normal as possible. "There shouldn't be anything unusual about that," he said. "If a patient's cholesterol level is high, the doctor wants to get it back to normal. The same holds true for blood pressure — get it back to normal. Doctors always want to return a condition to normal, except, for some reason, blood sugar levels in diabetes."

Williamson explained that for years most physicians were content simply to avoid the life-threatening condition of chemical imbalance known as ketoacidosis; they did not become alarmed if blood sugar levels were as high

as 200 or 300 mg, which is nearly twice the normal level. Even after insulin injections first became available in the 1920s, normalization of blood sugar levels was seldom a primary goal in managing diabetes. The insulin, made from material from animal pancreases, was rapidly absorbed in the blood. Because insulin was so short-lived, diabetic patients had to take injections every time they ate in order to control their blood sugar levels. Injections are not popular with most people, and many patients were reluctant to inject themselves before each meal. Much of the early research in diabetes focused either on how insulin acted on metabolism or on various ways to prepare insulin for more convenient administration, slower absorption, and longer effectiveness.

Some researchers, however, began to investigate some of the complications often seen in diabetics — gangrene, blindness, kidney or heart disease. Whether the high blood-sugar levels of diabetes caused these complications, or whether the complications would develop in some people because of heredity and regardless of diabetes, was long a subject of debate. A researcher, Dr. Marvin Siperstein, published a paper in 1968 concluding that heredity, not diabetes *per se*, caused vascular complications in diabetics. Sponsored by the National Institutes of Health and published in the prestigious *Journal of Clinical Investigation*, the article had credibility and apparent statistical validity. But the results did not square with Kilo's experience. "What this study said was that no known therapy could delay or modify these complications," Kilo explained. "Even a well-controlled diabetic would fall victim to stroke, heart attack, kidney failure, gangrene or blindness. But our records on well-controlled



Williamson with the electron-microscope purchased by the Kilo Diabetes and Vascular Research Foundation.



Kilo at work.

diabetics did not agree with the Siperstein report. I couldn't believe it."

Kilo looked to his alma mater, and to his former teacher, Paul Lacy, for advice about a study of the relationship between blood sugar level control and vascular disease. "Paul Lacy has always been cooperative and encouraging," said Kilo. "He told me about a scientist who had spent a year at the Joslin Clinic at Harvard and was back at Washington U. He thought we should be introduced.

Lacy introduced them, and so began the unusual collaboration of Kilo and Williamson, practitioner and professor. "Charlie provided needle biopsies of leg muscle," Williamson said, "and our first study used electron-microscopy and morphometric techniques" to study the relationship between blood sugar levels and changes in small blood vessels.

"The Kilo Diabetes and Vascular Research Foundation came about because of this study," Williamson said. "In questioning the findings of the Siperstein study, we could not get government funding because the study had been so well received. We applied several times, but to no avail."

"We had to raise funds to support this research," Kilo said. At first, lab space and some people to assist as they could were made available by Lacy. Kilo spent his own money for lab supplies. "Then, I decided to see if I could get some of my patients to give money for research at the University, and they did." Eventually, a group of patients and families began to hold an annual fund-raising dinner dance and to raise funds by selling greeting cards or manning a refreshments booth at a suburban community festival. "We even put collection cannisters around in stores in

Kirkwood and the west county area," Kilo said.

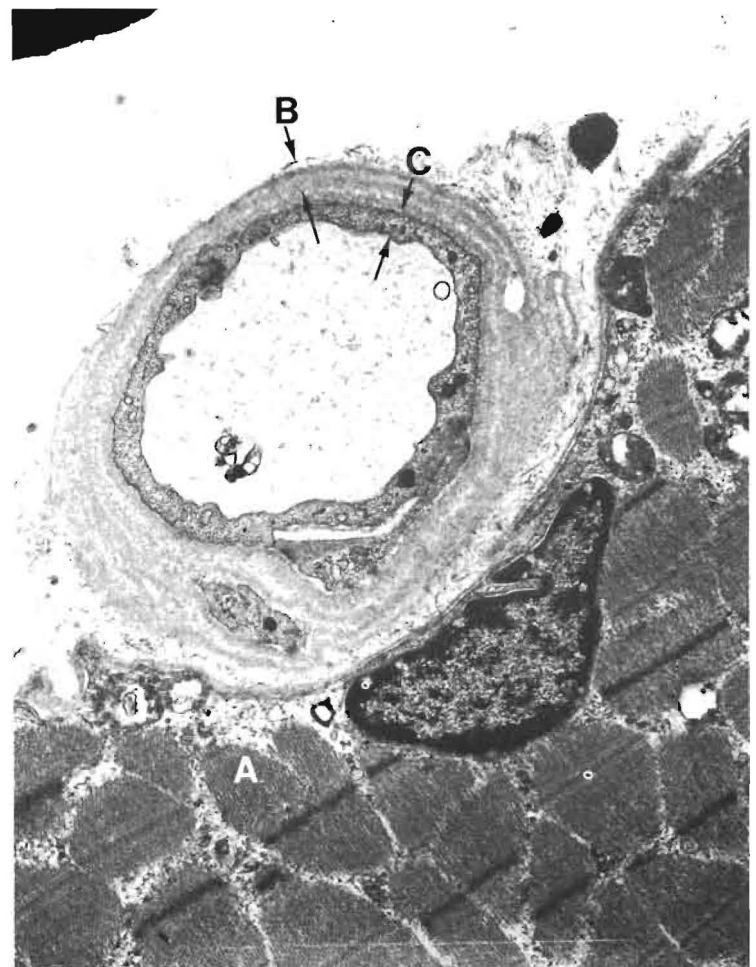
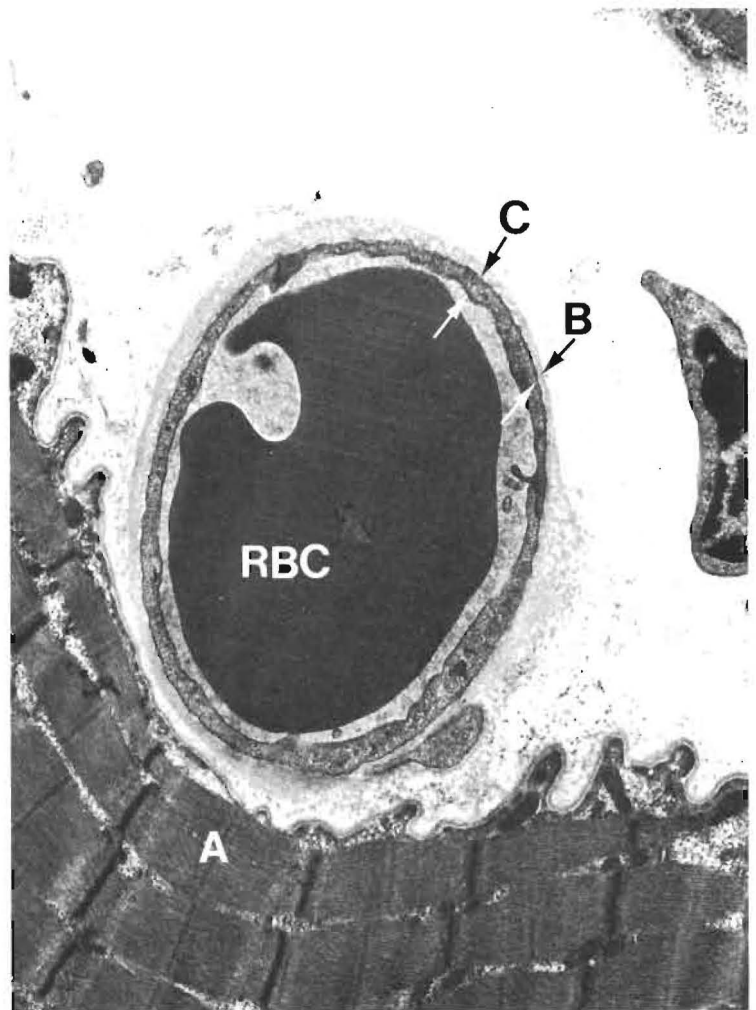
The partnership of the clinician and the researcher grew stronger, and the fund-raising foundation grew more formal and active, and much more sophisticated, in meeting another challenge in the 1970s.

Anyone who has ever disagreed with, say, a car dealer, and then escalated the argument up to the manufacturing corporation, probably has some idea of the difference between questioning one research study and taking on a multi-million-dollar, multi-medical-center, 15-year research project. Kilo and Williamson issued just such a challenge to the University Group Diabetes Program (UGDP) in the 1970s, and it was that challenge which tempered and forged their partnership, and spurred their foundation to grow up and succeed in a hurry.

"I was a UGDP co-principal investigator at Washington U. and Barnes Hospital," Kilo said. "So I knew about the design of the study. That's why I was shocked when the results came out in 1970."

The UGDP was a large study involving a thousand diabetic patients at a dozen medical centers throughout the country. One group of patients received trivial

These two electronmicrographs show thigh muscle biopsy tissue enlarged approximately 25,000 times. At top is a normal specimen; at bottom, tissue from a diabetic patient. "A" indicates muscle cell. RBC stands for red blood cell. The arrow labeled B points to the basement membrane or outer wall of the cell. The arrow labeled C points to the endothelial lining. Note that on the specimen on the right, the outer wall, B, is greatly thickened compared with the specimen on the left. The sample on the right was taken from a patient with uncontrolled diabetes.



amounts of insulin; another received insulin matched more closely to their needs. Two groups were placed on different oral medications (tolbutamide and phenformin), and another group received a placebo. The test was designed to compare the efficiency of the four therapies in managing diabetes, and to compile statistical information on diabetes and vascular diseases in each of the therapy groups. Data from participating institutions was sent to a central computer for processing, interpretation and reporting. The UGDP reports stated that diet alone was as effective as insulin, that small blood vessel disease was not related to the duration and severity of diabetes, and that oral hypoglycemic agents might be toxic.

"We just couldn't believe that these results were reliable, even though we had been part of the study," Kilo said. "What the study was claiming didn't fit with my experiences with patients in my practice or in my work at Barnes."

The study discouraged the use of insulin and oral agents, and gave rise to the possibility of litigation against physicians who prescribed them and who had been doing so for years. "Even worse," Kilo said, "it jeopardized hundreds of thousands of diabetic patients."

"Charlie and I felt that we shouldn't simply sit back and accept the study without a re-examination and re-evaluation," Williamson said. Williamson had earlier research upon which to base his own doubts about UGDP conclusions. Williamson's previous studies of muscle biopsies showed that in non-diabetic and healthy people, the thickness of the outer walls of capillaries increases with age and with distance from the heart. In normal women, vessel walls are thinner until menopause, when they begin to thicken. Blood vessel walls in young people with newly diag-

nosed diabetes were the same as those in normal people of the same sex and age. However, the longer the diabetes persisted and the more severe it was, the thicker the capillary walls became. In diabetics who had well-controlled blood sugar levels, however, the vessel walls were of near normal thickness, and the rate of thickening was slowed. In Williamson's study, some of the diabetics had had the disease for 30 to 50 years. This work suggested that glucose is toxic to capillary walls and that control of blood glucose levels would protect the vascular system.

Kilo was on the UGDP executive committee at Washington University Medical Center, and to that group he first voiced his concerns about the study's results, urging a re-evaluation. He and Williamson had reviewed the Washington U. Medical Center data, and found even more reason to doubt the conclusions of the study as a whole. Most of their peers were less than enthusiastic about their intent to challenge the study's conclusions. Some were overtly opposed; others offered only private encouragement. "I was told more than once that I was 'tilting at windmills,'" Kilo said.

But up to that time, he had confronted several seemingly major setbacks in his life plans, and hadn't simply accepted "no" as an answer.

As a very young man, Kilo had been an Air Force Cadet in pre-flight training, but the program was eliminated. He switched fields, and went to the University of Illinois and Chanute Field to learn meteorology, and served in the Air Force in the U.S. and Alaska. He then went, as a meteorologist, to Iran under President Harry Truman's Point Four Program. "Many Point Four people were in their 60s, retired from

American universities and government agencies. They were involved and wanted to make a contribution to human life. I went through Iran with many health teams and watched them treating glaucoma and infectious diseases. I was impressed with their knowledge and what they could do personally to help people," Kilo said. "I thought that maybe, eventually, I could become a doctor."

After four years of service in Iran, Kilo enrolled at Washington U., studied chemical engineering, and applied to change his major to pre-medicine. The pre-med dean at the time said "no," ostensibly shutting the door to medical school — had Kilo been one who took "no" for an answer.

"After a short and frustrating time," Kilo reminisced, "I just took myself over to the medical school and knocked on the door of admissions dean William B. Parker. He listened to my tale and told me to write him a letter about why I wanted to be in medical school." Kilo wrote the letter, presented his grades, and took a few extra courses which Parker had recommended. He was admitted to the class of '59.

"Dr. Parker was a beautiful person. He was open to listening to me. Without that, and his encouragement and guidance, I wouldn't have been accepted." Not easily settling for "no" might be one factor in Kilo's having become a highly successful insurance salesman to support himself in medical school and finance his medical education.

So, when Kilo told of his intent to re-evaluate the UGDP and met with a chorus of "no's," he had a bit of resistance experience upon which to draw. He needed it.

"You have to remember," Williamson said, "that if someone ten or so years ago told a room full of physicians that high blood sugar levels, in and of themselves,

were harmful, he'd be laughed out of the room. Doctors were entirely skeptical that hyperglycemia *per se* could be toxic to the body."

Kilo and Williamson began to review the UGDP, and for a while it seemed as if they had only each other in the profession to encourage them, and only the fledgling Foundation raising funds with greeting cards and festival booths to help defray the costs.

"For a long time, we were frustrated in approaching the data," Williamson said. First, it was difficult to obtain the data from the participating medical centers and from the computer center at the University of Maryland. The federal agency which had funded the study claimed ownership of the computer data, and upheld its claim through the ensuing legal procedures instigated by 40 diabetologists who, with Kilo and Williamson, had formed the Committee for the Care of the Diabetic, represented by Boston attorney Neil Chayet.

Kilo personally visited several of the participating centers to obtain muscle biopsies from patients and to look at the charts and raw data on each patient. They worked in their spare time, for Kilo had responsibilities to his patients, and Williamson to the school, the students, and his laboratory. During three years, they were able to review nearly all of the original UGDP data from the centers.

Acquiring the data was only part of the problem; finding a focus when confronting a myriad of details for hundreds of patients was an equal, or worse, problem. "We finally decided to focus first on the 200 people who had died," Williamson said, "and to look at the timing and circumstances of their deaths, the causes of death, and the adherence to the study protocols."

"It became clear," Williamson continued, "that many of the



In the Kilo Foundation conference room, Beth Kalb, R.N., (seated at left) demonstrates the use of new glucose self-monitoring equipment to Kilo Foundation director Jeanne Rogers and patients Brenda Willerding and Kenneth R. Harper. Kalb is one of three nurse educators on the staff of the Foundation, and is head research nurse currently conducting five clinical trials in Kilo's office.

deaths could not be attributed to the treatments the patients were supposed to be on because they simply were not on them."

In their re-evaluation, they learned of many patients who rarely came in for their clinic appointments, but were carried on the records as participants. "It would be impossible to manage the disease, monitor the compliance, and record the effects of medication on weight, blood fats and blood pressure, and the blood sugar levels of such patients," Kilo said. "Nearly 40 percent of the patients were not seen in the clinics for periods of a year or more, but the analysis treated their data as if they had been coming in right on schedule!" Kilo

continued, "Keeping appointments is crucial to weight loss and diet. Without adherence to a diabetic diet, nothing can control blood sugar levels."

There was the example of the patient in the study who took one dose of the assigned medication, did not return to the clinic for a year, and was subsequently reported dead. The death was included in the statistics for the medication assigned. In essence, there was little consistency between the treatment group patients were assigned to, the treatment maintained by the physicians (in some cases, house staff, not principal investigators), or the compliance of the patients.

Kilo and Williamson published numerous refutations in scientific journals. They lectured to physicians and laymen alike, and were joined gradually by others in their fields. The financial press picked up the controversy and followed the fortunes of pharmaceutical firms. The FDA and the NIH became increasingly involved. Eventually, the American Medical Association and the

American Diabetic Association withdrew their endorsements of the UGDP study and its conclusions. The white heat of controversy simmered down, but some coals still smoulder.

"The UGDP was very controversial, and still is, even after all these years. A lot of people put a lot of faith in it because it was seen as a well-designed, state-of-the-art study," Williamson said. "Some people are still firmly on one side of the fence or another. What I hope we have all learned is that even the most sophisticated statistical technology cannot prevent spurious results, and that computer power is no substitute for careful review and objective assessment of data by the human mind. We need to examine the raw data more critically at all stages of scientific investigations," Williamson said.

Kilo is less reserved and conciliatory, perhaps because of his daily direct involvement with people suffering from the complications of diabetes — peo-

ple he not only cares for, but also cares genuinely about. "Those first UGDP reports, even though they're now discredited, were in the mainstream of medical education and treatment for years, and they set the course for care of the diabetic. Diabetes is the worst-treated disease in the world," Kilo maintains. "More and more, physicians agree that the goal is to control blood sugar levels. But for years, physicians in many specialties were not trained in how to do it or taught the reasons why it is so necessary." He gives as an example of the problems, pediatricians whose backgrounds and experience might not include tight control of blood sugar levels. "By the time complications develop, the patients would be older and no longer seen by pediatricians," Kilo said, "although the damage starts in childhood."

Kilo and Williamson still publish and lecture extensively about the need to control blood glucose levels, and in many meetings and conventions they continue to receive questions and challenges to their reports on the UGDP.

While they were conducting their research about the study, the Kilo Foundation, led by patients and their families and friends, developed from an informal group of volunteers into an incorporated foundation, with a board and elected officers, and with a growing level of sophistication and success. Formally incorporated in 1972, the Foundation has developed an expertise in staging special events for fun and fund raising. The annual dinner dance has grown from a small group of volunteers and patients to a larger social event drawing several hundred couples and generating sums in the five figures. For the sports minded, the Foundation produces successful golf tournaments and celebrity softball games, garnering impressive publicity and profits.

Signing the endowment agreement last winter are, from left to right, Williamson and Kilo with M. Kenton King, M.D., Dean of the Washington University School of Medicine, Vice Chancellor Samuel B. Guze, M.D., and pathology department head Paul Lacy, M.D., Ph.D.

When the St. Louis National Charity Horse Show, the oldest horse show in the U.S., was revived in 1977, the Kilo Foundation volunteers helped horse show association leaders raise money to present the show. The Foundation received part of the receipts. The prestige equestrian event was combined in 1981 with the Grant's Farm Manor Horse Show, headed by brewing magnate and sportsman August A. Busch, and the Kilo Foundation was designated as the major benefactor. The show raised \$110,000 in 1982. The Foundation's affiliation with the St. Louis National provided an opportunity to draw into its board and its circle of volunteers and participants many prominent St. Louis business and civic leaders.

Major events turning in major sums have not turned the Foundation from its beginnings. A recent issue of the Foundation's newsletter carried columns of tribute donors and memorial gifts from individuals. The level of giving and volunteering shown by patients and their families is eloquent testimony of their love for, and confidence in, their physician. The Foundation hired its first director in 1976. With only one full-time employee and minimum costs for administration, the Foundation today turns a high percentage of its funds over to research and education.

Research now encompasses a staff of 15 in the Foundation laboratory at the Washington U. Medical Center, and a relatively new 2,100 sq. ft. addition to the lab. Current projects include: the role of vascular injury and leakage in kidney disease and heart disease, the role of heredity and environment in diabetic vascular disease, the role of hormones in diabetic vascular disease, and studies of scar tissue changes in diabetes. The Foundation is also



evaluating new oral agents for treatment of adult-onset diabetes, studying insulin pumps and problems related to their use. Williamson and his colleagues are also collaborating with physicians at Case Western Reserve University in a study of vascular disease in cystic fibrosis patients. "Our basic research," Williamson summarized, "is directed to understanding how high blood glucose, high cholesterol, and high blood pressure, injure blood vessels and contribute to heart disease."

Education is a major focus both of Kilo's treatment of diabetic patients and of the Foundation's activities. Kilo, Williamson and three nurse educators are responsible for a variety of workshops, books, papers and lectures for patients, their families and health-care professionals. A distant hope of Kilo's is to build a public education center in west St. Louis County, perhaps a home-like residential center where patients will be able to live under medical supervision to normalize their blood sugar levels, while learning self-monitoring of blood sugar levels, diet, exercise and all aspects of living with diabetes.

"Education is the key to disease prevention and to the care

and management of chronic disease," Kilo said. "In diabetes today, that means educating the patients and their families about how to keep the disease in check and avoid complications."

The Foundation has also established a program to continue the work of Kilo and Williamson after their retirement or death. On its tenth anniversary several months ago, the Kilo Foundation for Diabetes and Vascular Research set up an endowment agreement with Washington University School of Medicine. "The Kilo Foundation endowment will support research in diabetes and vascular disease for as long as the School of Medicine exists," Kilo said.

Firming and formalizing the ties between the Foundation and the school is characteristic of Kilo, who is agent for his medical school class, a member of the Century Club and the Eliot Society. "We have one of the finest schools," he said, "and Washington U. researchers are respected throughout the world." He spoke knowingly and enthusiastically of the ambience which promotes interdisciplinary collaboration throughout the School of Medicine, an attitude which was

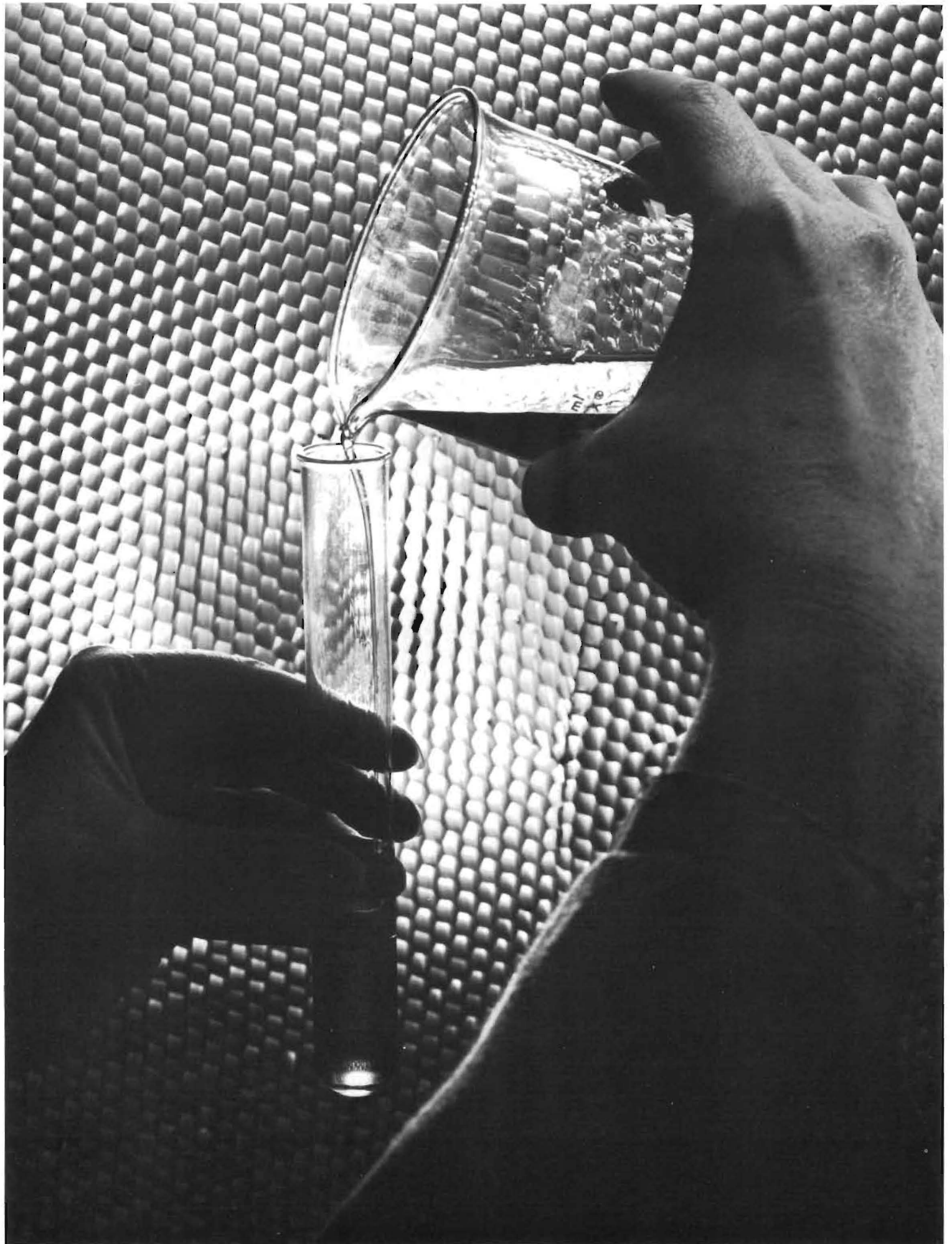
the touchstone for his introduction to Williamson more than 20 years ago.

And what have these two partners in an unusual endeavor to say about each other after all those years and adventures?

"Charlie is a go-getter, a truly unique person. He is an outstanding clinician with a remarkable way of making people feel better just by being there. He is an excellent diagnostician and dedicated to helping the sick. And he has a profound appreciation of the importance of today's research in finding tomorrow's cures."

"Joe Williamson is one of the finest people I have ever met — hard working, thoroughly dedicated, just excellent. I can't say enough."

The gestures and the eyes tell more of their profound admiration and friendship than any words they use or anecdotes they tell. Through all of their shared and individual risks and achievements, Kilo and Williamson have obviously reached a rare meeting of minds and hearts. And so the diabetologist and the pathologist, the clinician and the professor, and the fund-raiser and the scholar, continue side by side in treatment and research. ■



Interferon: From Sci Fi to Black Bag?

by Kathy Liszewski

Eking through an alien galaxy 20 years ago in a tubular spacecraft, the earthborn crew glumly confronted yet another crisis. "Four dead . . . the others in a coma! And nothing we can do but watch them go . . . one by one." So said Flash Gordon in Dan Berry's King Features Syndicate comic strip of July 12, 1960. In dashed a scientist in lab tunic and tights, shouting: "This could be it! Interferon! It knocked out the virus in the lab animals!" Interferon!?

Has it really traveled from outer space to the physician's black bag? Not yet, quite, but it is real enough to warrant intensive research. A year or so ago, it seemed as if every other headline in the news said something about interferon. It is common enough now that it has its own acronym in the journals — IFN.

These natural proteins assist the body in fending off viruses. IFN does not directly attack microorganisms, but rather, like a flare shot into the night sky, acts as a molecular messenger released from cells undergoing viral invasion to alert neighboring cells. The latter then arm themselves with antiviral proteins to resist viral infection. IFN also plays important, although not yet entirely delineated, roles in modulating the immune system and in regulating cell proliferation. The earlier hopes that it would be a quick cancer cure—all have subsided, yet researchers throughout the world, and at Washington University School of Medicine, are finding that Interferon still shows promise as a valuable human therapy.

Recently, clinical trials in Israel reported IFN's remarkable success in treating acute viral infections. Dr. Stanley Levine, professor of pediatrics at Hebrew University, Jerusalem, found that when IFN was given to 16 patients — none of whom were expected to live — 10 subsequently made dramatic recoveries.

An English researcher has developed an Interferon nasal spray which reportedly can avert cold symptoms. Dr. David Tyrrell of the Medical Research Council in England conducted a double-blind clinical study of healthy volunteers. Eleven of them received an IFN nasal spray followed by an intranasal spray of rhinovirus type 9. Eleven others received a placebo spray plus the rhinovirus. In the IFN group, eight subjects remained healthy without signs of a cold, three had mild illness. Those in the control group did not fare as well: Eight developed full-blown colds, two were mildly sick and only one escaped illness. Tyrrell's work points to IFN's potential utility as a broad spectrum antiviral agent. The question remains, however, whether IFN given early after infection can abort a cold.

In Osaka, Japan, the Green Cross Corporation is currently involved in producing an Interferon eye lotion. Ryoichi Naito, chairman, believes his clinical data proves that IFN helps cure eye diseases caused by viruses such as keratitis, conjunctivitis, and herpes of the eye.

In the U.S., numerous human trials are underway to test the effectiveness of IFN in fighting cancer. Previous reports have shown only intermittent success. Some have questioned whether IFN works at all. Others have pointed to the source, lack of significant quantities, or administrative procedures as answers to the hit-and-miss propensities of IFN.

With the recent rise in recombinant DNA technology, a new source of pure, well-characterized Interferon has become available. The recombinant DNA product appears to be active against some forms of human cancer.

Three separate, preliminary Phase I trials using human leukocyte interferon (one of the three known types) were conducted at

Stanford University School of Medicine, the M.D. Anderson Hospital in Houston, and at the National Cancer Institute in Bethesda, Maryland. In all trials, significant tumor regressions were observed.

Part of the problem associated with IFN research is the Interferon itself. What is its source, purity and activity? Far from being a single entity, Interferon is a heterogeneous group of molecules whose origins vary with the species, cell type and stimulation used for isolation. Additionally, IFN is species-specific which, for human therapy, necessitates its isolation from human sources or from the genetic engineering of human genes.

Interferons have been classified into three major types, Alpha-, Beta-, and Gamma-IFN. Alpha and Beta are induced by a viral attack, while Gamma is produced during an immune response. To complicate matters, researchers have so far discovered 15 subtypes of Alpha-IFN from the leukocytes which produce them. Connective tissue cells called fibroblasts manufacture Beta-IFN, and five subtypes are known.

It is Gamma (also called "Immune") Interferon which intrigues Washington U. School of Medicine researchers William Catalona, M.D., professor of surgery (urology), and Timothy L. Ratliff, Ph.D., research assistant professor of surgery (urology).

However, the hand of serendipity initially guided the researchers into their present course.

In an experimental trial, the researchers were testing a phenomenon known as Antibody-Dependent Cell-mediated Cytotoxicity. In ADCC, specific antibodies attach to target cancer cells. When incubated together, certain lymphocytes bind to the "tail" (Fc region) of the anti-

bodies; this link leads to killing of the tumor cell.

First, the investigators had incubated a tumor target cell with an antibody against it (which had been made in rabbits). Following binding by the antibody to the tumor cell, they added a bacterial protein from *Staphylococcus aureus* called Protein A (SpA) to the mixture. SpA is a small protein (molecular weight 41,000 daltons) which binds to the "tail" of the major class of antibodies called IgG's. To complete the test peripheral blood lymphocytes, PBL's, isolated either from normal people or from bladder cancer patients were added.

Theoretically, the SpA would bind to the antibodies attached to tumor cells and block the killer lymphocytes from binding the antibody and forming the bridge which leads to tumor destruction.

But Mother Nature, in this case, fooled the investigators.

"It turns out that what we saw was very high killing every time we added SpA. At first we thought someone had made a mistake, so we repeated it again and the same result happened again. After repeating it a third time we knew something real was going on," says Dr. Ratliff.

This relieved Robert McCool, the technician performing the tests. McCool is now a third-year medical student at WUMS.

"We then determined that the response depended on both dose and time. Further studies suggested that there was a substance being produced which might somehow be mediating these cell-killing effects."

At the time of this initial work (1978–79), Interferon was very much in the research limelight. It dawned on the investigators that SpA could induce IFN production in the lymphocytes and that this might account for the unexpected destruction of target cancer cells.

So, they tested for the presence of Alpha- and Beta-IFN, the most commonly studied IFN at the time. But Mother Nature wanted the last laugh: the results came back negative.

Taken aback but undaunted, the investigators began further studies to test for the more rare Gamma-IFN. Finally, Mother Nature yielded her secrets. Several different schemes all verified the presence of Gamma-IFN.

Ratliff and Catalona had not only determined that SpA would induce Gamma-IFN in their test system, but also that Gamma-IFN was a potent stimulator of the natural killing activity of the peripheral blood lymphocytes.

In collaboration with Dr. Richard P. MacDermott, M.D., associate professor of medicine (gastroenterology), further studies have uncovered other significant findings.

According to Ratliff, Gamma-IFN is produced by at least two types of lymphocytes — one called a T-cell ("T" because it requires the Thymus gland for maturation) and another called a Null cell (i.e., lymphocytes which lack characteristic T-cell markers and which may be T-cell precursor cells).

Researchers have known that, in traditional *in vitro* tests, another immune system cell called a macrophage enhances Gamma-IFN production when incubated with T-cells. Surprisingly, Ratliff and associates found that macrophages inhibited Gamma-IFN production by SpA-treated Null cells from healthy donors.

Ratliff and associates have also determined *in vitro* that removing macrophages will increase Gamma-IFN levels of the peripheral blood lymphocytes from bladder cancer patients.

"Our latest findings concerning possible regulatory activity of macrophages on Gamma-IFN

production may be significant," indicates Ratliff. "Very conservatively, these findings suggest that the cancer patients may be making an immune response to the tumors, but that response may be masked by macrophages."

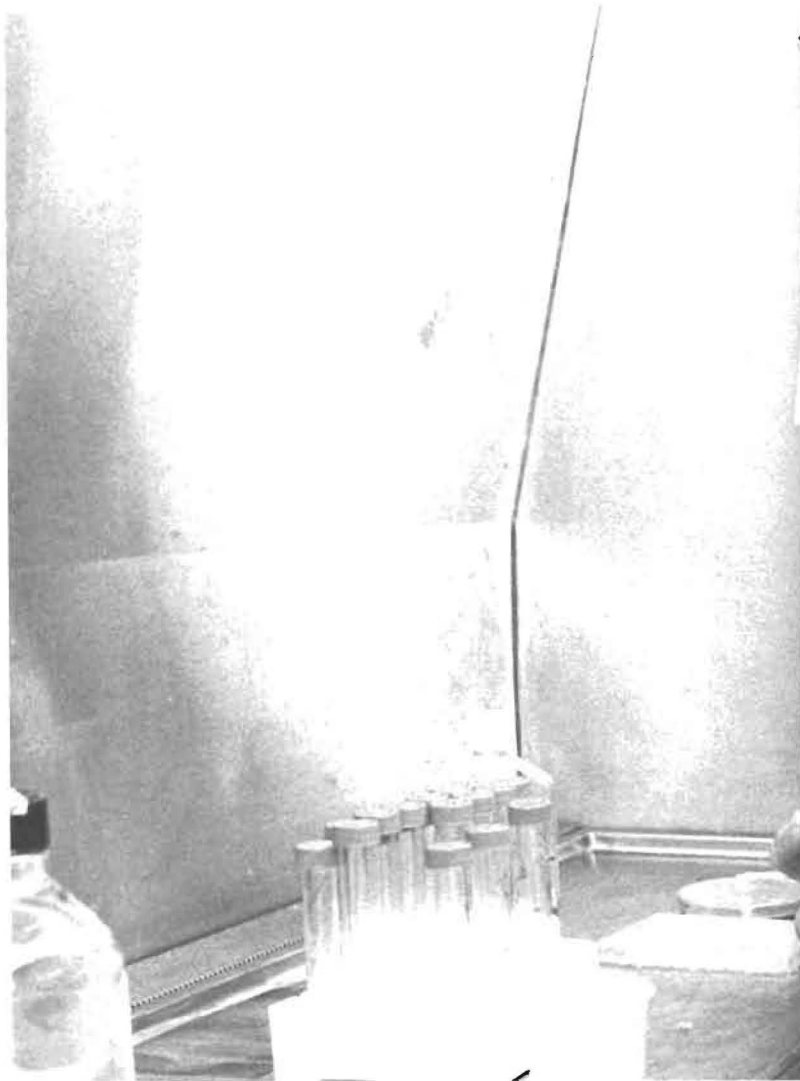
Other reports have shown that macrophages are important regulatory cells that inhibit *in vitro* proliferation of lymphocytes derived from cancer patients. It is speculative whether the same phenomenon occurs *in vivo*. If it does, however, then searching for what causes macrophage inhibition of these cells of immunity might prove valuable in treating the cancer itself.

Only a handful of other researchers are studying the relatively rare Gamma-IFN, but several important findings have surfaced concerning this potentially important agent.

Ninety percent of mice injected with bladder tumor cells develop cancer. When concomitantly treated with Alpha-IFN, only 15–20 percent get cancer. Only five to 10 percent of mice injected with Gamma-IFN develop cancer. Even more intriguing, investigators have discovered Gamma-IFN to be up to 200 times more potent than Alpha-IFN in inhibiting tumor growth when used at the same dosage.

Gamma-IFN is much more labile and difficult to purify free of contaminants. However, recent strides in recombinant DNA technology may rapidly solve this exasperating problem. Companies have successfully produced recombinant Alpha- and Beta-IFN. Genentech has just cloned from both mouse and humans the single gene responsible for Gamma-IFN. Greater quantities can now be made available for research.

Dr. Ratliff and associates have been selected to test the Genentech product which will be provided by the company.



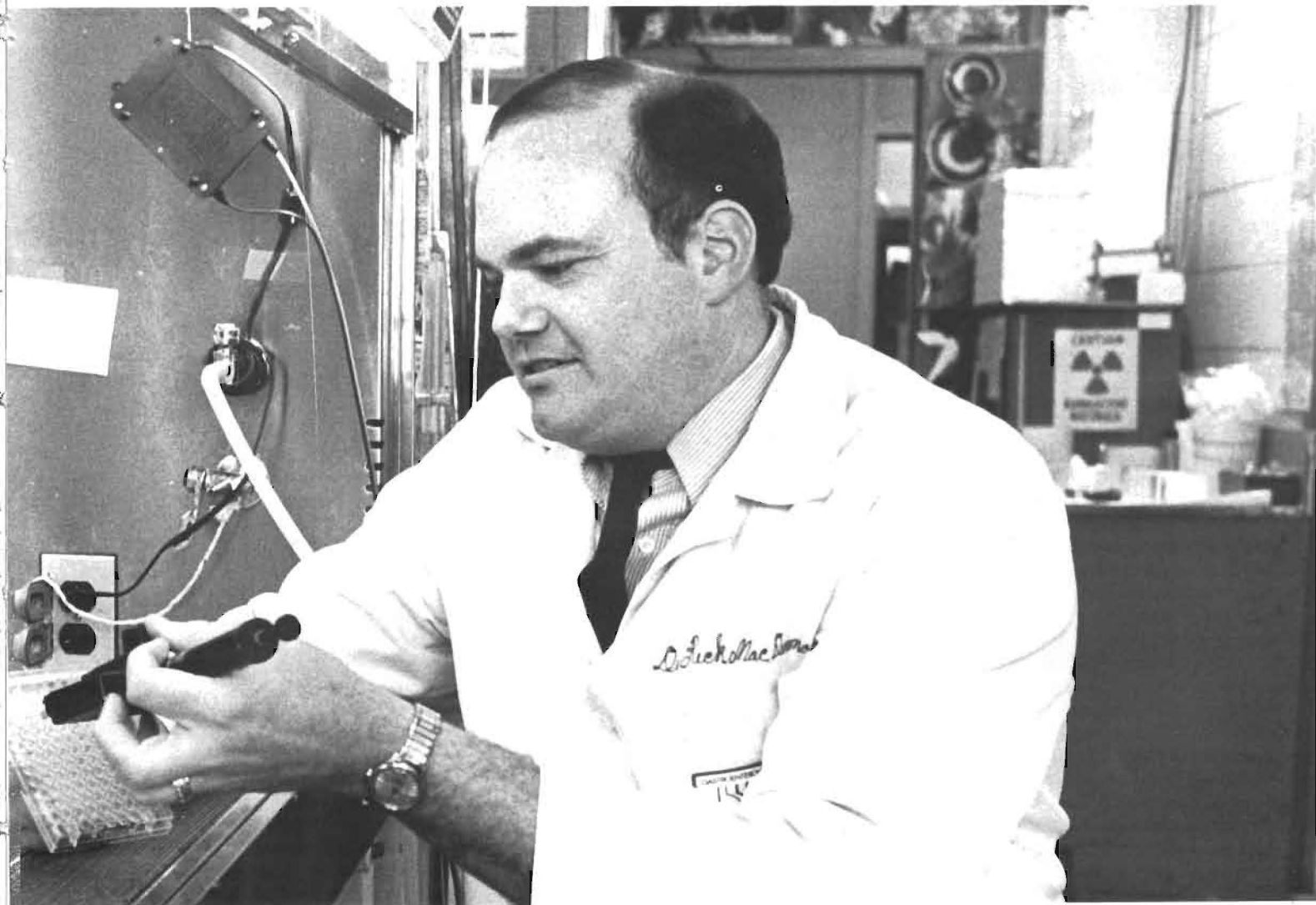
"Gamma-IFN from Genentech is a pure product, and we will test to see if it has the same properties as pure, natural Gamma-IFN. The company would like to use mouse systems to determine if their Gamma-IFN is effective and to delineate the mechanism of its action. Ultimately, they would proceed with clinical trials in humans based upon the information obtained in mouse studies," says Dr. Ratliff.

Doesn't this put great pressure on investigators in trying to define when this therapy can be used to try to save human lives

versus when the therapy is optimized?

"It is a difficult line," admits Dr. Ratliff. "We could say right now that we think we have activity and therefore rush into human therapy. In fact, there are already some human trials using recombinant Gamma-IFN. But sometimes I think we put the cart before the horse. Approximately 10 medical centers are conducting human studies," according to Ratliff, "but we declined."

"Based upon trial and error treatments in humans, they're finding out that the pharmacokinetics of Gamma-IFN are much



different than that of Alpha-IFN. Intramuscular injection may not be a viable route for Gamma-IFN. One may have to use it intravenously. And it's cleared very rapidly IV, so you have to overload the system. They are finding all this out on patients participating in Phase I trials."

At present, Catalona and Ratliff are not conducting any human studies. They first wish to well characterize Gamma-IFN in a mouse system to determine "what tumor burden it can handle, whether it will work

if administered in the veins or in muscles."

Ratliff believes that a slower, more careful approach to the use of Gamma-IFN in humans would prove most beneficial, but adds: "People have different opinions as to the proper approach with Interferon therapy. There are some who think you can go right to the clinic if you have an indication and if you have a patient who has no other real choices. So the patient and doctor may agree that, as a last-ditch effort, it's worth a try."

Ratliff estimates that it will be quite some time until their group is ready to begin studies on humans.

Before conducting human studies, Catalona would like to arrange with other companies to test their recombinant Alpha- and Beta-IFN to assess effectiveness and mechanisms. The Washington U. group would like to examine Alpha-, Beta-, and Gamma-IFN systematically to determine the best dose and testing regimen in mice and, subsequently, in humans.

Richard P. MacDermott, M.D., associate professor of medicine (gastroenterology), collaborates with Catalona and Ratliff on several projects. MacDermott's lab is in the Wohl Clinic Building.

It appears that different types of tumor have different susceptibilities to each specific type of Interferon. Catalona notes that it seems that tumors suspected to be of viral origins respond better to IFN therapy. In a serious disease called Juvenile Laryngeal Papillomatosis, wart-like tumors of suspected viral origin engulf the larynx and may choke off



William Catalona, M.D., professor of surgery (urology), in one of the labs at the Jewish Hospital of St. Louis.

speech and sometimes breathing. When subjected to IFN therapy, these growths can disappear.

"Because IFN is a potent antiviral agent," says Catalana,

"it's my personal prejudice that tumors of viral origin may respond better than cancers of other origins." Further studies should elucidate the best candidates for Interferon therapies.

"A lot of work remains to be done," adds Ratliff. "Researchers who are working with Interferon believe it has sound biological activity. But whether it will be effective as a single agent in

therapy remains unclear. Many think that it's greatest potential could be when used in conjunction with other therapies." ■



Timothy L. Ratliff, Ph.D., research assistant professor of surgery (urology), checks progress with Amos Shapiro, M.D., in one of the labs at the Jewish Hospital of St. Louis. Shapiro is studying in St. Louis, and is regularly on staff of the Hadassah Hospital in Jerusalem.

Bandits, Bodies, and Bones

by Paul G. Anderson, Ph.D.

The Winter 1982 issue of *Outlook Magazine* featured an article by Joan and Louis Avioli, M.D., reporting on a cultural exchange tour of China by a group of American physicians and scientists last spring. It is interesting to note that American doctors have been witnessing revolutionary changes in China for more than 75 years. The wonder and excitement of observing an ancient nation being transformed is seemingly inexhaustible.

This two-part article describes the work of five American doctors at the Peking Union Medical College, beginning in the World War I era. The "main characters" of our story all had significant ties to Washington University School of Medicine, either before or after their experiences in China. Part I of this series focuses on the very significant contributions to the building of PUMC by Edmund V. Cowdry, Ph.D., who later held several academic and research positions at Washington U. Part II will trace the involvement of Harvey J. Howard, Paul H. Stevenson, G. Canby Robinson, and Eugene Opie at various times with Peking Union Medical College (PUMC).

This series, like the Aviolis' article, uses the current Pinyin spellings for Chinese names (i.e., Peking Union Medical College of Beijing). Paul G. Anderson, Ph.D., is archivist in the library of the Washington U. School of Medicine.

In 1909, when Robert Brookings and others began raising an endowment to reorganize the Medical Department of Washington University, he appealed to the General Education Board, which had been established by John D. Rockefeller. The request was not a shot in the dark.

The General Education Board was known to be sympathetic to bold ideas to advance medical education, and not just in



the U.S. In 1908, the Rockefellers had organized the Oriental Education Commission to explore the needs of schools in China, Japan, and India. On the Commission's agenda were serious proposals to found one or more medical schools in Asia. By comparison with plans such as these, Brookings' objective of reforming an institution on the banks of the Mississippi was rather modest.

Among the preliminaries to Rockefeller involvement in China was the establishment of the Rockefeller Foundation in 1913, to serve as the grant-giving organization for the family. The Foundation, in turn, funded a second, more detailed investigation of needs and opportunities, this time in China, alone. The findings prompted creation of the China Medical Board in 1914, signaling decisions to target one particular country, and education in one particular subject area. Late in 1914, the China Medical Board chose Beijing over other Chinese cities as the place where the program would be carried out. The choice was made in part because Beijing was China's

capital, in part also because the China Medical Board hoped to acquire and reorganize an existing medical school there. That was Union Medical College, which was sponsored by a group of British and American churches under the aegis of the London Missionary Society.

Of all the many interests which Western nations maintained in China in the early part of this century, those of the missionaries were among the oldest and most widespread. Up until the time of the Rockefeller involvement, the dispensing of Western philanthropy was almost exclusively their province. In both their motivations and their methods, the Rockefellers were only a few steps removed from backers of traditional foreign missions. Indeed, both the Foundation and the China Medical Board were headed by Baptist clergymen. In bidding for control of Union Medical College, the China Medical Board pledged to do "all in (its) power to maintain the religious tone and work in the college and hospitals." When it came to hiring faculty for the

Cowdry at his desk at the Peking Union Medical College, ca. 1919. From the Cowdry Collection, WUMS Archives.

reorganized school, John D. Rockefeller, Jr., himself, promised "to select only persons of sound sense and high character, who were sympathetic with the missionary spirit and motive."

The London Missionary Society agreed with little hesitation to sell Union Medical College to the China Medical Board. A period of intensive planning and preparations for the reorganized Peking Union Medical College ensued. Among the measures to upgrade the level of medical education at the institution was the establishment of a temporary premedical school to boost Chinese students to American standards for admittance. Another measure was the decision to make English the language of instruction, rather than Chinese, which was preferred by most missionary schools. A board of trustees was appointed, and a resident director chosen. For the latter, the China Medical Board turned first to a young associate

professor of medicine at Washington University, G. Canby Robinson. However, Robinson was deeply involved in organizing the Medical Service of the then-new Barnes Hospital, and he declined the offer. The position was assumed by another promising young physician, Franklin C. McLean, a resident at Rockefeller Institute.

McLean made his first inspection of PUMC in the summer of 1916. Work began that year to convert old buildings and construct new ones to form the medical campus. The premedical school was housed in the former Union Medical College building, Lockhart Hall. Adjoining it was an imposing residence known as "Prince Yu's Palace," which was also purchased by the China Medical Board. Because in Mandarin Chinese, the name "Yu" sounds very much like word for "oil," and because it was common knowledge who was funding PUMC, the whole campus came to be referred to as the "Oil Prince's Palace" by the people of Beijing. To extend the complex, construction was underway on the Anatomy Building, first of several new structures planned for PUMC.

When McLean returned to the United States in 1917, he began to recruit new heads of academic departments for PUMC. The first to sign was Edmund V. Cowdry, who became professor and head of the Anatomy Department. Cowdry, then 29 years of age, was a Canadian with an undergraduate degree from the University of Toronto. He completed a Ph.D. in anatomy at the University of Chicago in 1913, specializing in cytology. From there he moved to Johns Hopkins University as an associate in anatomy. Experience at these outstanding North American universities defined his commitment to high standards in research and

teaching. Beyond that, he displayed something very akin to the "missionary spirit and motive" in his eagerness to impart a message to the Chinese. His only reservations about a sojourn in Beijing arose out of concern for his wife, Alice, whom he married in 1916. But Alice Cowdry assured her husband that she would be able to withstand the rigors of life in the Orient and supported his acceptance of the position.

Not until a year after the appointment did the Cowdrys leave the United States. In the meantime, Cowdry recruited other faculty for PUMC. Chiefly, he acted to build his own department, but also contacted candidates to teach other medical specialties. The process was made difficult by the entry of the United States in World War I. McLean himself was granted a leave of absence to join the American forces in France. Cowdry was, for a time, the only PUMC professor with a certain commitment to teach in Beijing.

In the summer of 1918, the Cowdrys departed on their long journey overland to San Francisco, then by ship to Shanghai. Two varieties of turmoil awaited them in China. Cowdry had been informed that there were outbreaks of pneumonic plague in several provinces and cities, some reported along the rail line linking Shanghai with Beijing. What he was less prepared to encounter was the political and civil disorder then endemic to China. The Cowdrys never encountered the plague on their journey. But they had a very close brush with social chaos when their Beijing-bound train narrowly escaped being attacked by a sizable "bandit" army.

Statue demonstrating acupuncture positions in the Office of Imperial Physicians in Beijing, 1921. Cowdry Collection, WUMS Archives.



The Anatomy Building under construction at the PUMC, ca. 1917. From the Cowdry Collection, WUMS Archives.



The China which received the Cowdrys in 1918 had been officially a republic for less than seven years. Before that, various factions throughout the huge nation had struggled against the corrupt last rulers of the Qing (Manchu) Dynasty. Sun Yatsen was prominent among the leaders who fought for the Republic, but his faction was not strong enough to command allegiance of all China. Indeed, no leader or faction was so strong. Huge districts of the country, whole provinces even, were dominated by independent warlords. Warlords who had lost battles and were driven from their strongholds could turn instantly into bandit chieftains who preyed alike on poor villages and on trains carrying the wealthy cross-country.

Another factor of the political disorder in China was the humiliating presence of foreign colo-

nies, concessions, and garrisons on Chinese soil. Newly arrived Americans could be blissfully unaware that, in Chinese eyes, they were lumped together with all other aliens in this regard. Officially, the United States frowned on foreign control of Chinese ports and other strategic areas. American policy was to advocate an "Open Door," where all outsiders were equal. But the United States put no pressure on the Japanese or British, to name only the most flagrant offenders against Chinese sovereignty, to surrender territories. Instead, the United States joined other powers in maintaining garrisons in China. This imposed a certain stability on the principal cities, foreign controlled or not. Beijing, for example, although the capital of a country at war with itself, was a curiously placid political island when the Cowdrys arrived there in the fall of 1918.



Construction of the Peking Union Medical College, ca. 1918. From the Cowdry Collection, WUMS Archives.

Cowdry recognized definite priorities as he began work at PUMC. One was to participate in the organization of the college administration. Another was to oversee the completion of the Anatomy Building and the equipping of its laboratories. Yet another was to conduct further studies of the needs of Chinese medical schools vis-à-vis Western standards. Because medical training at PUMC had not officially started, there were to be no heavy teaching responsibilities during his first years at the college. His own research interests in cytology Cowdry placed last on his list of priorities.

The Medical School proper was one of five divisions of PUMC. Others included the Premedical School, the Nurses Training School, the Hospital and Physical Plant, and the Department of Religious and Social Work. Within the Medical School were academic departments of Anatomy, Physiology (including Pharmacy and Physiological Chemistry), Pathology, Medicine (including Neurology, Psychiatry, and Pediatrics), Obstetrics and Gynecology, Ophthalmology, and Roentgenology. Throughout 1918, these chairs were filled and Cowdry, owing to his early arrival on the scene, influenced these decisions and many others. For example, he served on a special committee which negotiated the issue of how PUMC employees would be paid. China, with its political chaos, lacked a stable currency and, for various reasons, it was also not possible to pay directly in United States dollars. Instead, portions of salaries paid to the staff in Beijing were allotted in Mexican silver. The committee recommended and received a pledge from the China Medical Board to maintain a favorable fixed rate of exchange of two dollars Mexican to one dollar U.S. gold.

As work on the Anatomy Building progressed, construction of a new PUMC Hospital, the Chemistry Building, and extensions of the residential compounds was initiated. In 1918 over 3,000 workers were employed on the projects. At one point Cowdry invited a Chinese physician to inspect the amazing development of the "Oil Prince's Place." The doctor's reaction was that "Americans always do things the expensive way." He did not realize just how correct he was. Given wartime inflation and the worldwide scarcity of new technical equipment, the cost of building PUMC ballooned to several times what the Rockefeller Foundation had originally budgeted.

Cowdry took particular interest in building a good medical library. The collection of books and journals was, in his view, "our first requisite." Even before leaving the United States, he prepared lengthy lists of the titles that he wanted. He arrived at PUMC to find a competent librarian already on the job and struggling with a sorely inadequate budget. Cowdry sent urgent letters on the library's behalf, compiled more lists, and otherwise campaigned hard for the collection. He complained that he was buying books out of his own pocket. This lobbying evidently had some effect, for the China Medical Board did actually quadruple the library budget within a few years. The Rockefeller Foundation could eventually boast that PUMC had the best medical library in all of Asia.

Cowdry was equally energetic in gathering collections of anatomical specimens for use in his department. Shortly upon arriving at PUMC he began sending appeals to foreign-sponsored schools throughout China for embryos and fetuses. His choice of contacts was based on the



The anatomy laboratory of PUMC, ca. 1919, Cowdry Collection, WUMS Archives.

estimation that nothing so sophisticated as a preserved embryo could be obtained from Chinese physicians. But there were disadvantages in writing only to foreigners. More than one response declared, as did a Methodist medical missionary in Fujian Province, that "we are seldom called into (cases involving miscarriage or abortion) for Chinese seem to look on the foreign doctor as a disagreeable necessity to be called in only in the last ditch." Nevertheless, Cowdry was pleased with the overall results of his appeal. Eventually he also began receiving the cooperation of Chinese physicians. The first such contact was so surprising that the incident proved embarrassing. The director of the Chinese Army Medical

School in Beijing appeared unannounced one day at the PUMC compound to donate assorted specimens. Cowdry was out. The gatekeeper knew of no one else to call and, in exasperation, ejected the director from the PUMC grounds!

Even more difficult than the acquisition of small specimens was the procurement of cadavers; dissection had been forbidden under Chinese law and custom. A decree by the Republic in 1913 made it legal for the first time, if relatives of the deceased gave permission. Still, bodies were almost unavailable for use by foreigners. Cowdry at times resorted to various degrees of subterfuge. A source in Shanghai arranged to pack a cadaver in a crate containing other supplies, with no mention of it on the bill of lading. But a suspicious railway clerk discovered the body any-

way and refused the whole shipment. In at least one instance Cowdry enlisted the services of United States Marines to provide him with cadavers. But for all his efforts, only four cadavers reached the anatomy laboratories during Cowdry's first year and a half in Beijing. Later he established a supply, but under circumstances smacking of the worst American urban graft. It was arranged that bodies of executed criminals might be dissected, providing that the remains be given burials and interred in a special plot of land, with costs borne by the college. The land in question was the personal property of none other than the chief of the Beijing police.

When it came to making long-range plans for PUMC, Cowdry, like other Western educators, could not ignore the example that the Japanese set for the rest of Asia. Apart from his intention to consult libraries in

Tokyo, Cowdry wanted to visit Japan to learn something about the qualities of medical education there. Accordingly, he arranged a tour of fifteen Japanese medical schools in the summer of 1919 and described his findings in an article entitled "Anatomy in Japan" (1920). Cowdry was both impressed and disappointed with what he saw. Everywhere he saw modern facilities and dedication to medical science that he considered most laudable. But he also judged that Japanese schools had embraced the worst aspects of what he termed "Prussian philosophy," an inflexible, highly centralized approach to learning. Cowdry certainly understood that there was little that PUMC could do to modify the impact of the Japanese system on the Chinese. This was particularly true from 1919 onward, when the Japanese consolidated their hold on concessions and interests in China relinquished by the defeat-

"The Second Confucius:" John Dewey (center left), shown here with his wife, Alice, and Chinese associates in Nanjing. John Dewey Papers, Special Collections, Morris Library, Southern Illinois University at Carbondale.



ed Germans. Cowdry's objective, simply stated, was to promote understanding and cooperation between Western scientists and their Japanese counterparts.

Following his Japanese survey, Cowdry also undertook study of the teaching of anatomy at Western-sponsored medical schools in China. For this he made an extensive tour of cities up and down the China Sea coast, from Guangzhou (Canton) in the south to Shenyang (Mukden) in the north, in the autumn of 1919. In all, Cowdry visited nineteen institutions and received information by mail of about seven more. The only one which refused to divulge any data was a medical school in Qingdao, which the Japanese had seized from the Germans. The survey, with findings published as "Anatomy in China" (1920), found a great variety in teaching methods and facilities. For some institutions, such as the University of Hong Kong, the Japanese Medical School in Shenyang, and the French L'Aurore University Medical school in Shanghai, Cowdry expressed the highest praise. By contrast, he rated some outright "pernicious," as in the case of the school (unnamed) where anatomy was taught strictly via blackboard drawings, explained not by the instructor but by his native interpreter. Another school admitted plainly that "we don't teach histology, embryology, comparative anatomy, as our scope is to form practitioners only."

Worse still, in Cowdry's view, was the traditional training still being imparted to Chinese practitioners. He made many excursions outside the PUMC compound to observe Beijing physicians at work. He described his experiences in four different

articles published in 1920 and 1921. On one occasion he visited the Office of Imperial Physicians, where the deposed Emperor Puyi still received attention. There he was permitted to see the "Golden Mirror," an official textbook on medicine containing texts compiled over a period of 2,000 years. He was taken to inspect a shrine where a brass statue in human form was kept. The statue was stripped of the robes covering it, revealing a surface punctured by hundreds of tiny holes representing acupuncture positions. Cowdry had no appreciation for the therapeutic value of acupuncture. This visit reinforced what he had concluded from an earlier demonstration of the technique, when he saw a physician "sterilize" his needles by passing them through his hair. Cowdry was also shown two brass mules, male and female respectively. Patients were asked to rub the portions of the statues corresponding to the ailing parts of their bodies. Such teachings and practices typified traditional Chinese medicine for Cowdry. He recognized it as part and parcel of the entire system and philosophy of education. This, he reasoned, would have to change radically before modern science could truly take root in China.

There were hopeful signs. The fact that, under great pressure to improve military strength, the Chinese government had established new medical schools on Western models for the army and navy was one such indication. Moreover, certain particular events of the time suggested a new receptiveness to Western education. A dramatic example was the attention given the American philosopher and educator John Dewey when he visited China in 1919. Dewey arrived at the peak of his

influence as an exponent of liberalized school curriculums in the United States. He began his journey in the Orient with a stay in Japan, where he lectured widely and, all the while, sent to America a flood of articles on his perceptions of Japanese culture. The Emperor offered him a coveted membership in the "Order of the Rising Sun," whereupon Dewey created an uproar by refusing, explaining that the order was symbolic of Japan's undemocratic values.

The Chinese government and the intelligentsia in the principal cities were determined to pay no less homage to Dewey than the Japanese had paid. He was received by Sun Yatsen in Shanghai and traveled north to Beijing. In the capital he became a visiting professor at the National University, where he lectured on American philosophy and education. The lectures were attended by huge numbers of people, and every word that Dewey uttered was translated and reported in the Chinese press. Suddenly, it seemed, every educated Chinese was discussing American concepts of democracy, ethics, and material and scientific progress. Dewey attracted numerous Chinese disciples. The rector of the National University went so far as to hail him as the "Second Confucius." As he had done in Japan, Dewey reported his impressions of China in American publications. "A Political Upheaval in China," "Is China a Nation?," "Transforming the Mind of China," "What Holds China Back?," and "New Culture in China" were but some of the many titles to reach readers back home in the United States.

Cowdry and Dewey became acquainted via the social network of parties and receptions held for foreigners in Beijing. They and their wives became good friends. For Cowdry, Dewey was a kind of

godsend. Here was a man who apparently had discovered the correct formula to the immense problem of modernizing China and had the influence to put it to work. "Professor John Dewey of Columbia University," Cowdry wrote, "is perhaps doing more than any one person to divert the funds squandered by the militarists into educational channels and to lead the mass of people to see themselves as others see them and to assume full responsibility for the orderly development of their own lives."

The key was to give the masses a good stiff dosage of Western style education, at least strong enough to rally public support for the programs of an enlightened leadership. In essence, what Cowdry concluded from his surveys of medical education he believed to be true for the larger task of leading China into the modern world. "We cannot change the sentiment of a nation like China overnight, nor yet in fifty years' time," he argued, "but a beginning has been made in Peking."

In retrospect, it is easy to judge such perceptions naive, and to recognize that the enthusiasm for Dewey's teachings which swept China in 1919 and 1920 was a kind of intellectual fad. But to contemporaries, a vision of a Westernized, democratic China seemed no more naive or fantastic than another ideal which germinated at about the same time — to transform the country into a Marxist workers' state on the model of Lenin's Russia. There were, in fact, many competing formulas imported for the purpose of solving the great Chinese riddle. Dewey wryly observed — and Cowdry valued the observation enough to quote him — "whenever a few (foreigners) are gathered together in China, the favorite indoor sport is 'saving China.'"



Cowdry in a Beijing temple courtyard where traditional Chinese physicians practiced. Cowdry Collection, WUMS Archives.

When discussions of politics and philosophy did not satisfy, of course there were other "sports" available for the diversion of the elite foreign residents of Beijing. There were legation receptions, a spring and an autumn horse racing season, a riding stable, bridge clubs, lectures on art appreciation, and Chinese language lessons. Cowdry reported to the Rockefeller Foundation that "our experience is that life in (Beijing) is very much more strenuous from the standpoint of society obligations than life in Washington, D.C."

In 1919, Cowdry and his wife were joined by his father, Nathaniel, and his father's sister. Cowdry might well have encouraged their coming by writing, as he did to a Canadian friend, that "(Beijing) is a very good city to live in, in spite of the cold winter and the heat and dust of the summer. The water supply is first class. The police service as efficient as in any American city and there is no part where it would be unsafe to walk at any time, day or night." The elder Cowdrys quickly and effortlessly adjusted to life in Beijing. Nathaniel Cowdry was an amateur botanist. During his stay he began a scientific study of Chinese medicinal plants, using his son's laboratory. His work resulted in significant contributions

to the literature of a large botanical collection which ultimately was donated to the Department of Pharmacology at PUMC.

Laboratory research, not surprisingly, was the least productive aspect of Edmund V. Cowdry's experience at PUMC. The completion of the Anatomy Department facilities, his other administrative responsibilities, and the surveys of medical education all delayed a resumption of his work in cytology. Cowdry was not happy about this. An additional, unforeseen frustration encountered in Beijing was the fact that Alice Cowdry's health was not good. She suffered from a slow weight loss and other symptoms which the College Hospital director himself was unable to diagnose. Cowdry asked for a temporary leave of absence for the summer of 1920, on the grounds of needing to recruit new faculty and to consult with editors of journals to whom he had submitted papers. The Cowdrys told friends and colleagues that they would return in the fall. However, by the time of their journey they knew not only that Alice Cowdry was still afflicted, but also that she was expecting their first child. The Cowdrys decided, in view of these facts, that she would remain in the United States.

Cowdry was committed to return for the 1920–1921 academic year in Beijing. In the meantime he sought a new position. Much of the summer of 1920 the Cowdrys spent at the Marine Biological Laboratory in Woods Hole, Massachusetts. He resumed his cellular research; she succeeded in regaining her health. The Rockefeller Foundation asked Cowdry not to make his intentions to resign from PUMC widely known, for fear that it would make recruitment for the college difficult. Later that same season, underscoring the value that the organization placed on him, Cowdry was offered a position as an Associate Member of the Rockefeller Institute, which he readily accepted. He departed for China in November. In January 1921, while he was in Beijing, Alice Cowdry gave birth to Edmund V., Jr. The new father received the necessary dispensation to join his family by the following April. These peregrinations, interestingly enough, did not deter Nathaniel Cowdry from his botanical studies. The elder Cowdry remained in China throughout 1920 and most of 1921, when he returned with his sister to Canada.

Edmund V. Cowdry exhibited all the zeal of a good missionary while at PUMC, if perhaps not all

the patience that a missionary must have. His connections with the College were by no means completely broken at this point, for he maintained a lifelong association with the China Medical Board.

In the 1920's, Cowdry's career and reputation as a scientist were still developing and would take many dramatic turns. While associated with the Rockefeller Institute, he conducted extensive research expeditions in Africa. In South Africa he was instrumental in isolating the organism (thereafter called *Cowdria ruminantium*) which causes heartwater in animals. In Kenya, his chief interest was yellow fever. In Tunisia and Algeria, he investigated the etiology of malaria. Cowdry joined Washington University School of Medicine in 1928 as head of the Cytology Division of the Department of Anatomy, and became head of the department in 1941. At Washington University, Cowdry's chief research interests focused on cancer. He was Director of Research at Barnard Free Skin and Cancer Hospital from 1939 to 1948. From 1950 to 1960, he was Research Professor of Anatomy and Director of the Wernse Cancer Research Laboratory of the School of Medicine. He was noted not only for his work in the laboratory, but for his advocacy of increased public support for programs to fight cancer and for interdisciplinary programs in gerontology. Cowdry died in 1975, a major figure in the history of Washington University School of Medicine. ■

(To come: a professor captured by bandits, a Washington University alumnus on the trail of the "missing link," and other vignettes from the history of Peking Union Medical College.)

Note: *Outlook Magazine* has received notice that Edmund V. Cowdry, Jr., M.D. '45, died last August.

...And the Winners Are...

In early December, shortly before winter break, the Dean hosted a luncheon for prize-winning students from the 1981-1982 academic year. Thirteen named prizes were awarded by appropriate faculty members. Winners not present for the photo session included: Alan Kritz who

garnered the Dr. James L. O'Leary Neuroscience Prize, Mark Behlke and Phyllis Lynn Faust who won the Carl F. and Gerty T. Cori Prizes in Biochemistry, and Joan Larkins who received the Dr. Margaret G. Smith Award.



Top: Keith Thulborn, Ph.D., Alan Tenaglia, Anthony Pearlstone and Todd Swanson (from left to right) were awarded the Antoinette Frances Dames Prizes in Physiology and Biophysics for excellence in the field during the first year. Swanson also won the George F. Gill Prize and the Kehar S. Chouke Prize, both in anatomy.



Top: Robert Mittl and Anne Hutchison won the Edmund V. Cowdry Prizes in Histology. The prize was established in 1969 and is awarded to first-year students for meritorious work in microscopic anatomy.



Above: Dean M. Kenton King, M.D., opened the awards presentation after the luncheon.



Above: Timothy Frost, WUMS I; Mark Stark, WUMS III; and Frederick Barr, WUMS II, received the Dr. Robert Carter Medical School Prizes.



Richard P. Parsons, M.D., president of the Washington University Medical Center Alumni Association, presented the Alumni Scholarship Fund Prize to senior student Katherine Anne Parker.



Above: Carl F. Bigler, Robert A. Sivier, and Carl E. Fulwiler received the Richard S. Brookings Medical School Prizes. Bigler also received the Howard A. McCordock Book Prize in Pathology.



Above: Sheila Jones (left) earned the Academic Achievement Award, given for industry, perseverance, determination and enthusiasm in the first-year academic program. Katherine Parker (center) received the Alumni Scholarship. And MSTP student David Wilson (right) received the Oliver H. Lowry Prize in Pharmacology, which is given to second-year students.

NewsBriefs:

The medical school's department of physiology and biophysics is among the top ten such departments at American research universities, according to a study sponsored by the Conference Board of Associated Research Councils. The *New York Times* reported in January that the Conference Board is an ad hoc committee of the American Council of Learned Societies, American Council on Education, National Research Council, and the Social Sciences Research Council. Approximately 5,000 faculty members at 228 colleges were polled to determine their perceptions of departments' success in training professional scholars and researchers. Other criteria, including the numbers of journal articles published, were also included in the survey of 32 fields of study and research. Carlton C. Hunt, M.D., Edward Mallinckrodt, Jr., Professor, is head of the department of physiology and biophysics at the School of Medicine.

Arthur D. Loewy, Ph.D., associate professor of anatomy and neurobiology, was awarded an Established Investigator Award from the American Heart Association for work on how the brain controls and monitors blood pressure.

G. Lee Judy, executive director of the Child Guidance Clinic, Department of Psychiatry, has been elected vice president of the St. Louis chapter of the National Society for Fund-Raising Executives. The chapter has 115 members from colleges and universities, hospitals and health-care organizations, and civic groups in metropolitan St. Louis.



Samuel B. Guze, M.D., vice chancellor for medical affairs, Spencer T. Olin professor and head of the Department of Psychiatry, presents the collected and bound publications of Eli Robins, M.D., to the author. Robins, Wallace Renard Professor and former head of psychiatry, is internationally known for scholarship and leadership in linking mental illness with brain biochemistry. Robins joined the School of Medicine in 1951 and collaborated with Oliver H. Lowry,

M.D., then head of pharmacology, in a study of lipids in the nervous system. During his 12 years as head of psychiatry, Robins led the department in the classification of psychiatric disorders, biochemical research and epidemiological studies based on the classical medical model. His approach was long considered radical and isolated from the mainstream of psychiatry, but today is the approach of choice throughout the world. A member of Alpha Omega Alpha hon-

orary, Robins has received many honors for his work, including the Gold Medal of the Society of Biological Psychiatry in 1974, the Paul H. Hoch Award of the American Psychopathological Association in 1977, and the Silver Medal of the Salmon Committee on Psychiatry and Mental Hygiene in 1981. The four volumes of Robins' scientific publications were collected and bound by the Library of the School of Medicine.

Computed Body Tomography, a new book authored by 30 staff members of the Mallinckrodt Institute of Radiology, has been published and was well received at the last meeting of the Radiological Society of North America. Editors are Stuart S. Sagel, M.D., professor of radiology, Joseph K.T. Lee, M.D., associate professor of radiology

(both of MIR), and Robert J. Stanly, M.D. The book has chapters outlining the physical principles and instrumentation of CT. There are 1,500 illustrations from a fourth-generation three-second scanner accompanying details of CT techniques, applications to disease processes, CT interpretation and differential diagnoses.

The book also compares the efficacy of CT to conventional radiography, discusses pediatric applications of CT and clinical uses such as radiation therapy planning, CT-guided biopsies and drainage of abscesses. For more information, contact the Mallinckrodt Institute of Radiology.

Elsie Roush, Ph.D., assistant professor of occupational therapy, has developed a tonometer, in collaboration with Wallace DiBoll, Ph.D., professor of engineering. Clinical application motivated Roush, an anatomist, to develop an instrument for quantitative evaluation of muscle tone. Current clinical practice relies on subjective evaluation of muscle tone, precluding firm conclusions about the effectiveness of treatment, especially in work with children with hypotonicity. Reliability and validity studies of the tonometer are being conducted by undergraduate, graduate, and postdoctoral students.

Henry G. Schwartz, M.D., August A. Busch, Jr., Professor of Neurological Surgery, has received the Award of Merit from the St. Louis Metropolitan Medical Society. The Society's highest honor, the Award of Merit is presented only when the honors committee knows of a deserving recipient. Schwartz was appointed a fellow in neurological surgery at the School of Medicine in 1936, and ten years later was named professor of neurological surgery. He was acting head of the Department of Surgery from 1965 to 1967. He has been the Busch Professor since 1970. On the staffs of Barnes and St. Louis Children's hospitals and The Jewish Hospital of St. Louis, Schwartz was chief of neurosurgery at Barnes from 1946 through 1974. He is also consultant in neurosurgery at St. Louis City Hospitals, St. Louis County Hospital, and the Veterans Administration for the St. Louis area. He is a member of many national and international medical societies, has received numerous honors and awards, and serves as editor of the *Journal of Neurosurgery*.

Duck O. Kim, D.Sc., associate professor of physiology and biophysics, was elected a fellow of the Acoustical Society of America. The society's members include physicians, professors, engineers, musicians, speech scientists, and physicists. Kim was named to the society for his contributions to its technical committee on physiological and psychological acoustics. His research has dealt primarily with the neurobiology and biophysics of hearing, computer applications in neurobiology, and biomedical engineering. A graduate of Seoul National University, Korea, Kim received his doctor of science degree in electrical and biomedical engineering from Washington University. He received an NIH individual postdoctoral fellowship for 1972–1973, the Research Career Development Award for 1976–1981 and a research grant for 1982–1985. Kim is also a member of the Society for Neuroscience, the Institute of Electrical and Electronics Engineers, the Association for Research in Otolaryngology, and Sigma Xi.

Gustav Schonfeld, M.D., professor of preventive medicine and of medicine, recently addressed researchers attending a symposium in Israel on animal diabetes. Approximately 150 researchers from throughout the world attended the meeting which was sponsored by the International Diabetes Federation. Schonfeld lectured on "Metabolic and Hormonal Control of Lipoprotein Production." Schonfeld is director of the school's Lipid Research Center and is on the staff of Barnes Hospital.

Mary Ann Boyle, Ph.D., has been named Elias Michael Director of the Occupational Therapy program at the School of Medicine. She is responsible for planning and directing undergraduate and graduate programs in occupational therapy, and serves as assistant professor of occupational therapy. Boyle received her Ph.D. degree in neurosciences in 1982 at the University of Kansas at Lawrence. Her seven years as occupational therapist include three years as chief occupational therapist at hospitals in Kansas and Florida. Boyle is a member of the American Occupational Therapy Association and is a book reviewer for the *American Journal of Occupational Therapy*. She was a founder and former chairman of the Capitol Area District of the Kansas Occupational Therapy Association.

Emerson Electric Corporation of St. Louis has donated an \$85,000 image analyzer to the urology division of the Department of Surgery. Division researchers W.D.W. Heston, Ph.D., and Jonathan Fleischmann, M.D., are using the analyzer to count the number of cancer cells surviving doses of ten different chemotherapeutic agents. The studies will help determine the most effective doses and combinations of drugs used against eight different types of tumor.



Virginia V. Weldon, M.D., has been appointed Deputy Vice Chancellor for Medical Affairs at the School of Medicine. Her appointment, effective immediately, was announced by Samuel B. Guze, M.D., vice chancellor for medical affairs and president of the Washington University Medical Center. Formerly associate vice chancellor for medical affairs, Weldon will continue to serve as vice president of the Medical Center and as professor of pediatrics. She is on the staffs of Barnes and St. Louis Children's hospitals. A specialist in pediatric endocrinology, her research on mechanisms of abnormal growth in children has received national recognition. She is a member of the Institute of Medicine of the National Academy of Sciences, the Association of American Medical Colleges, Endocrine Society, Society for Pediatric Research, Lawson Wilkins Pediatric Endocrine Society, the American Pediatric Society, the American Association for the Advancement of Science, and the St. Louis Medical Society. She has served as a consultant on several government projects, and is currently a member of the National Advisory Research Resources Council of the NIH.

The Alumni Report

Class Agents Hear of Success

Most of the Class Agents for the Washington University School of Medicine Alumni Annual Fund were able to attend a reception and brief meeting to hear the good news about the new Class Agents program. Since the beginning of the Annual Fund Year, July 1, 1982, a total of 1,278 alumni, alumnae and former house staff have contributed \$197,899 to the annual fund. More than one out of every four alumnae and alumni are now participating. Contributions to the Annual Fund may be designated for the Medical Teaching Fund, or for any department in the school.

Paul Hageman, M.D., '34, National Chairman of the Medical Alumni Annual Fund, reported that 309 new donors have been added to the program, thanks to the efforts of the Class Agents. Also, 969 continued their previous support. At the campaign's midpoint, alumni giving had surpassed the previous year by 24 percent.



Some of the Class Agents at the meeting included (from left to right) Harry Agress, M.D. '32; Max Deutch, M.D. '26; Penelope Shackelford, M.D. '68; Jerome Aronberg, M.D. '71, partially hidden behind Stanley Hampton, M.D. '34.



**Medical Center Alumni Association
Box 8049
660 S. Euclid
St. Louis, MO 63110
Richard P. Parsons, M.D., President**

**Jack Siefkas, Director
Medical Alumni and Development
Programs**

**Chris Owens, Director
Alumni Programs**

**Ruth Moenster
Secretary**

**The alumni office is located in
Room 107 of Wohl Hospital.**

Michelle Berman, M.D. '81, and Harold Zarkowsky, M.D. '61, share a few stories about their experiences as Class Agents at the meeting and reception in the Library room of Queeny Tower.



The group followed Brown through a maze of planting boxes, gazebos, brick pathways and fountains in the Ridgway Center exhibit hall, transformed for the show into a lush orchid jungle.



Orchids and Champagne Brighten a February Sunday

One of the more successful events in the new series of Alumni Association programs in St. Louis was held on February 6. David H. Brown, Ph.D., professor of biological chemistry, led a group of alumni, alumnae, and faculty through the orchid show at the Missouri Botanical (Shaw's) Garden, in south St. Louis. Brown has long been an orchid aficionado and grower. Following the tour and commentary, the group enjoyed a champagne brunch at the Garden's new showcase, the Ridgway Center.



David H. Brown, Ph.D., professor of biological chemistry (and orchids), shared his knowledge of orchid varieties, climate and soil conditions, blooming periods, and suitability for the horticultural hobbyist.



A fountain in the orchid display area

Cancun Conference



A Mayan god at the ruins at Chichen Itza.

From January 29 through February 5, approximately 70 members of the Alumni Association attended the annual clinical conference, this year held in Cancun, Mexico.

Note: Next year's Clinical Conference will be held from February 11-18, 1984, in Hawaii. It's never too early to start thinking about joining members of the WUMC Alumni Association for scientific sessions, sun and surf and so on.



Physicians and spouses also attended a lecture on Mayan civilization to prepare them for several of the cultural tour opportunities.



A Mayan vendor with his family's handiworks.



The beach-front view from the Hyatt Hotel at Cancun. The thatch-roof structures are typical of contemporary Mayan housing.



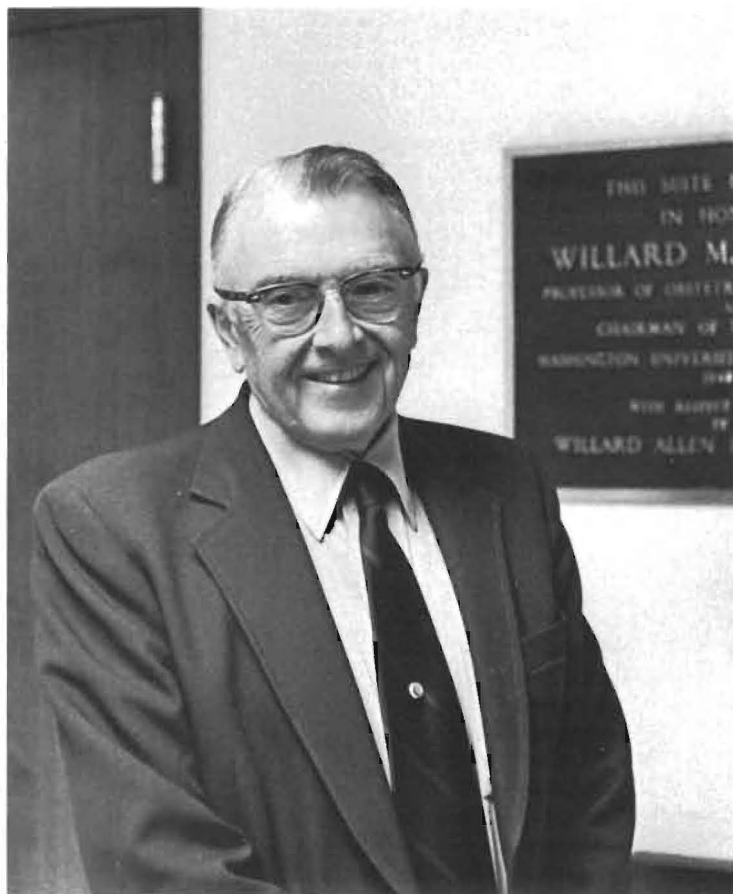
The group visited the ruins at Chichen Itza, site of the largest Mayan pyramid uncovered to date. Many climbed the stairs, and the bravest of the bunch ventured inside to work their way up through narrow, low passageways. They viewed two jade carvings of tiger-like animals, fought off feelings of claustrophobia, and managed to keep their footing on the narrow stairways.



The Hyatt Cancun poolside patio.



Elmer Brown, M.D. '50, Associate Dean for Continuing Medical Education, planned the program. Here, he gets some feedback from Daniel Rosenbloom, M.D., former house staff member of the Association.



Former OB/GYN Department Head Receives Distinguished Achievement Award

Willard M. Allen, M.D., who was professor and head of the department of obstetrics and gynecology at Washington U. School of Medicine from 1940 until 1971, received the Distinguished Achievement Award of the Society of Gynecological Investigation. The Award was presented at the Society's annual meeting in March in Washington, D.C.

Allen's research interests have focused on sex hormones, and while he was at the University of Rochester, before joining the W.U. faculty, he was the first person to isolate a pure form of

progesterone. He helped to name the hormone, and he demonstrated that it could be used to maintain pregnancy. While at W.U., he worked to develop clinical applications of estrogen and progesterone, and to a lesser extent, testosterone.

Allen retired from W.U. in 1971 and became professor of obstetrics and gynecology at the University of Maryland School of Medicine. He served as Associate Dean there from 1974 through 1982.

Siefkas to Direct Development Programs

M.L. Jack Siefkas has been appointed Director of Medical Alumni and Development Programs at Washington University School of Medicine in St. Louis.

Announcement of the appointment was made by Herbert F. Hitzeman, Jr., vice chancellor for university relations at Washington University. As director, Siefkas will work closely with the vice chancellor for medical affairs in planning all alumni and development activities and programs.

Before coming to St. Louis, Siefkas was director of development and public affairs at Southern Illinois University School of Medicine in Springfield. His duties there included organization and direction of alumni programs, development programs, publications, media relations and special events.

His experience includes serving as vice president for college



relations at Stephens College in Columbia from 1971-78, and as director of development at Drake University in Des Moines, Iowa, from 1969-71. He was associate director of development and director of alumni affairs at Simpson College in Indianola, Iowa, for two years, and a national advertising account executive for several years with the *Des Moines (Iowa) Register and Tribune*.

He holds the bachelor's degree in business administration from Simpson College.

Siefkas is a member of the Association of American Medical Colleges Group on Public Relations, the Public Relations Society of America and the Council for the Advancement and Support of Education (CASE). He has won a number of CASE awards, and has completed three special training programs in deferred giving.

Glaser Named President of ACCA

Robert J. Glaser, M.D., trustee of Washington University and president of the Henry J. Kaiser Family Foundation, based in California, was elected president of the American Clinical and Climatological Association. The Association was founded in 1884 as a society of physicians interested in the effects of climate on health. Its limited membership includes distinguished academic clinical scientists and outstanding clinical practitioners. Glaser succeeds George Cahill, M.D., professor of medicine at Harvard Medical School.

Glaser has been a trustee of the Kaiser Family Foundation since 1970, and president and chief executive officer since 1972. From 1965 to 1970, he was vice president for medical affairs and dean of the Stanford University School of Medicine. Glaser was vice president for medical affairs and dean of the medical school at the University of Colorado from 1957 to 1963. Before joining Stanford, Glaser was president of the Affiliated Hospitals Center and professor of medicine at Harvard.

'20s

Gabriel A. Rivera, M.D. '29, is now living in the Elizabeth Manor Sanitarium, 340 S. Alvarado, 218 C., in Los Angeles (zip 90057). He would appreciate hearing from his classmates and colleagues at that address. His wife, Maria, wrote a note of thanks for receiving the photograph of the 50th Reunion of the class, and requested correspondence with Rivera.

'30s



James McMullen, M.D. '37, sent this photo of his grandson "showing precocious interest in orthopedics" while his son, Richard, was "boning up for a . . . quiz." Richard is in medical school.

'40s

Bernard S. Lipman, M.D. '44, was acknowledged at Grand Rounds at the Grady Memorial Hospital/Atlanta, on December 14. Drs. J. Willis Hurst, Robert Schlant, and Nannett Wenger commented on Lipman's many years of teaching at Emory Medical School. Hurst presented Lipman with a certificate signifying his appointment to Clinical Professor Emeritus, Emory University School of Medicine.

James C. Sisk, M.D. '46, has been elected a member of the Executive Committee of the newly consolidated Board of Trustees of the national Blue Cross and Blue Shield Association. The Chicago-based association is the national organization of the 67 Blue Cross and 68 Blue Shield Plans in the U.S. Sisk is also chairman of the board of trustees of the St. Louis Blue Shield Plan. He specializes in dermatology and is the only practicing physician on the national Executive Committee.

Thomas D. Brower, M.D. '47, has been doubly honored by the University of Kentucky College of Medicine. A visiting professorship has been established in his name, and a new conference room and library for residents has been named after him. He is head of the orthopaedic division, U. of Kentucky Chandler Medical Center. Brower began the division in 1964 and has become known as the "father of orthopaedic education in Kentucky."

James T. Brown, M.D. '48, and six Springfield colleagues are entering the 24th year of zani-ness as "The Singing Doctors," specializing in decent harmony and irreverent satire. Brown's class will celebrate its 35th reunion in May.

'50s



John Kendig, M.D. '56, has been appointed chairman of the neuro-

surgery division at St. John's Mercy Medical Center in suburban St. Louis.

Kenneth R. Smith, Jr., M.D. '57, is the 1983 president of the St. Louis Metropolitan Medical Society. He is professor of surgery in the section of neurological surgery at St. Louis University Medical School.

'60s

Robert L. Palmer, M.D. '64, was elected Chief of Medical Staff and Director of Emergency Services at Wallowa Memorial Hospital in Enterprise, Oregon.

Michael Kelley, M.D. '69, has entered the private practice of radiology as chief of cardiovascular radiology, and co-director of the cardiac catheterization laboratory at Anaheim Memorial Hospital in Anaheim, California. His book, *Cardiac Imaging in Infants and Children*, was published in March 1982 by the W.B. Saunders company.

'70s

Robert J. Capps, M.D. '78, specializes in internal medicine and rheumatology, and has become a member of the Boone County Medical Society, in central Missouri. He is at the University of Missouri Hospital and Clinics in Columbia.

Carlton S. Pearse, M.D. '78, has become a member of the Metropolitan St. Louis Medical Society. He specializes in obstetrics/gynecology and lives in Chesterfield, Mo.

In Memoriam

Frank Glenn, M.D. '27

Frank Glenn, M.D. '27, internationally known surgeon who had retired in 1967 as chairman of the surgery department and surgeon-in-chief at New York Hospital-Cornell Medical Center, died in January 1982, at the age of 80. He had been associated with New York Hospital and Cornell since 1932, and was appointed surgeon-in-chief in 1947.

He was known for his work in surgery of the biliary tract, as well as for his achievements in cardiovascular surgery. He was a past president of the American College of Surgeons. He was the author of several books and more than 350 papers on surgery and on surgical training. Among his prominent patients were Oscar Hammerstein and Shah Mohammed Riza Pahlevi of Iran.

Glenn was the first to receive the Maurice Greenberg Distinguished Service Award, established in 1981 by the joint board of New York Hospital and Cornell Medical Center. In 1973, the hospital named a new cardiopulmonary intensive care unit in his honor.

He is survived by his wife, Esther Child Glenn, son Gardner S. of Detroit, daughter Prudence G. Harris of Washington, and five grandchildren. Funeral services were private, and a memorial service was held on January 31, 1982, at the Glenn family farm in his native Sparta, Illinois.

Donald Strominger, M.D. '53

Donald B. Strominger, M.D., professor of pediatrics at the Washington University School of Medicine, died suddenly Feb. 22 of an apparent heart attack. He was 54 years old.

Services were held Feb. 26 at Graham Chapel on the Washington University campus.

Strominger received the M.D. degree in 1953 from Washington University School of Medicine. He served his internship, residency and chief residency at the St. Louis Children's Hospital, and was preceptor in allergy at the Washington University Clinics. He had served on the staffs of the St. Louis Children's Hospital, the Barnes Hospital, St. Luke's Hospitals and St. John's Mercy Medical Center.

Strominger also had a strong interest in cystic fibrosis, and was an active member of the General Medical and Scientific Advisory Council of the Cystic Fibrosis Foundation. He served as chairman of the foundation's Center Committee from 1976-78, and most recently served as the foundation's Center Director's Representative. Strominger held fellowships in the American Academy of Allergy, the American College of Allergy, and the American College of Chest Physicians. He was a member of the American Association of Certified Allergists, the American Association for Clinical Immunology and Allergy, and many other medical associations and pediatrics societies.

Strominger wrote numerous articles on pediatrics, the treatment of allergies and cystic fibrosis. He was a member of Alpha Omega Alpha medical honorary, and was listed in the book, "The Best Doctors in the U.S. — A Guide to the Finest Specialists, Hospitals and Health Centers."

His community involvements included membership in the Yale University St. Louis Alumnae Board of Directors, the William Greenleaf Elliot Society of Washington University, and the board of directors of the Opera Theatre of St. Louis. He was president

of the Little Symphony from 1975-77, and medical director of the University City Board of Health in 1982.

Strominger is survived by his wife, Marleah Hammond Strominger; two daughters, the Rev. Linda Ruth Strominger of St. Louis and Dale Hammond Strominger of Philadelphia; a son, Mark Randall Strominger of Morris Plains, N.J.; two brothers, Dr. Jack Strominger of Cambridge, Mass., and Norman Strominger of Albany, N.Y.; and his mother, Esther Strominger of Hallandale, Fla. Memorial contributions may be made to the Opera Theatre of St. Louis or to the Cystic Fibrosis Clinic at the St. Louis Children's Hospital.

1912

Paul J. Everhardt, M.D.,
March 9, 1981

1917

Robert Mueller, M.D.,
January 5, 1983

1920

Sam B. Grant, M.D.,
November 14, 1982

1921

Herbert S. Pyne, M.D.,
February 27, 1982

1925

Guy M. Maness, M.D.,
September 15, 1982

1926

John M. McCaughan, M.D.,
July 21, 1982
Caleb S. Stone, Jr., M.D.,
January 1, 1982

1927

Frank Glenn, M.D.,
January 12, 1982

1928

John S. Harter, M.D.,
April 8, 1982
Guy N. Magness, M.D.,
June 7, 1982
Oswald B. Schneidewind,
October 13, 1982
Arthur L. Stockwell, M.D.,
July, 1982

1933

Harry Goldman, M.D.,
April 25, 1982
Oreon K. Timm, M.D.,
June 2, 1982

1934

Mary M. Schmeckebeier, M.D.,
September 7, 1982

1935

Heinz E. Haffner, M.D.,
October 22, 1982
Augustin Jones, M.D.,
October 24, 1980
Thomas McArtor, M.D.,
April 17, 1982
Ben Senturia, M.D.,
July 7, 1982

1936

Ralph K. Earp, M.D.,
November 20, 1982
Stephen S. Ellis, M.D.,
November 27, 1982
William H. Jacobson, M.D.,
March 19, 1982
Thomas E. McMillan, M.D.,
April 1, 1982

1937

Carl E. Lischer, M.D.,
May 17, 1982
Edgar H. Little, M.D.,
September 19, 1982
William J. Quinn, M.D.,
October 26, 1982

1939

Mark J. Brockbank, M.D.,
August 17, 1982
Sam Jones, M.D.,
July 13, 1982

1940

Albert Fleming, M.D.,
October 8, 1982

1944

Ivan E. Brown, M.D.,
November 3, 1982

1945

Edmund V. Cowdry, Jr., M.D.,
August 30, 1982

1947

Lee A. McNeel, Jr., M.D.,
May 26, 1982
Arnold Namrow, M.D.,
March 12, 1982

1949

Gordon A. Munro, M.D.,
October 8, 1982
John M. Ohtani, M.D.,
June 21, 1982
Anthony J. Raso, M.D.,
April 4, 1982

1953

Sun H. Lau, M.D.,
October 23, 1982
Donald B. Strominger, M.D.,
February 22, 1983

1976

Oliver Manigo, M.D.,
May 18, 1982
Alan Teranishi, M.D.,
March 9, 1982

Former House Staff

Seth S. Barnes, M.D.,
June 4, 1982
Boyd K. Black, M.D.,
August 1, 1982
Kenneth Fowler, M.D.,
July 1982
C. E. Gilliland, M.D.,
November 9, 1982
Miriam Lending, M.D.,
September 13, 1982
Gerald Levine, M.D.,
August 31, 1982
William J. Natoli, M.D.,
August 11, 1982
Charles H. Rammelkamp, M.D.,
December 1981
Allen H. Sherman, M.D.,
December 12, 1978
Stephen G. Sinclair, M.D.,
March 16, 1982
Jung wan Kang, M.D.,
May 1, 1982
Carl H. White,
June 8, 1982



HAPP

C. Edward Schwartz, Health Administration and Planning Program graduate of 1968, has been appointed assistant vice president for health science, and hospital director, at the University of Minnesota Hospitals and Clinics. He is also on the faculty of the program for hospital and health-care administration

at the University. He had previously been chief operating officer at the University of Michigan Hospitals. Schwartz is president-elect of the HAPP Alumni Association and preceptor for HAPP graduates. He is also a preceptor for Cornell University's Sloan Program in Hospital Administration.

Former House Staff News



George L. Tucker, M.D., clinical associate professor of surgery at Washington U. School of Medicine, is the new chief of surgery at St. Luke's Hospitals. He succeeds C. Alan McAfee, M.D. '42, who has held the post since January 1969. Tucker received

his medical degree from Harvard in 1956, served as an intern and resident at Barnes Hospital, and joined the Barnes medical staff. He is currently president of the Barnes Staff and Allied Society. He was chief of the Washington U. Surgery Service at City Hospital for three years, and is president-elect of the Missouri Surgical Society, and a fellow of the American College of Surgeons. St. Luke's Hospitals are on Delmar Boulevard in the City, and on Woods Mill Road in the County.

Jean Wendy Temeck, M.D. (house staff 1980), was elected to fellowship in the American Academy of Pediatrics. She is a clinical fellow in pediatric endocrinology and metabolism at Cornell University and at New York Hospital.



PT

Johann Lee Ellerbrake, professional physical therapist and specialist in the education of handicapped children, has been appointed administrator of the Ranken Jordan Home for Convalescent Crippled Children. The home is in suburban St. Louis. Ellerbrake has been director of the Mamie O. Stookey School for the Developmentally Disabled in Belleville, Illinois. Ellerbrake received her bachelor's degree in physical therapy from Washing-

ton U. in 1957. She succeeds another Washington U. alumnae, RosaLee Conner, who had retired and who passed away on February 28.

Ranken Jordan board president Joseph P. Logan noted the late Mrs. Conner's "decade of exceptionally devoted and efficient administration, during which she guided Ranken Jordan to the top rank of extended pediatric care facilities."

Letters to Outlook

After reading the article about the *New England Journal of Medicine* in the Autumn 1982 issue of *Outlook Magazine*, I believe you should be informed that my son, Edwin W. Salzman, M.D. '53, should be recognized as Deputy Editor of the *New England Journal of Medicine*. He has been professor of surgery

at Harvard, and was named as Deputy Editor in 1981.

J. Marvin Salzman, M.D. '29

Note: Outlook Magazine welcomes letters from readers for use in this section. Address your letters to: Outlook Magazine, 660 S. Euclid, Box 8065, Washington U. School of Medicine, St. Louis, MO 63110.

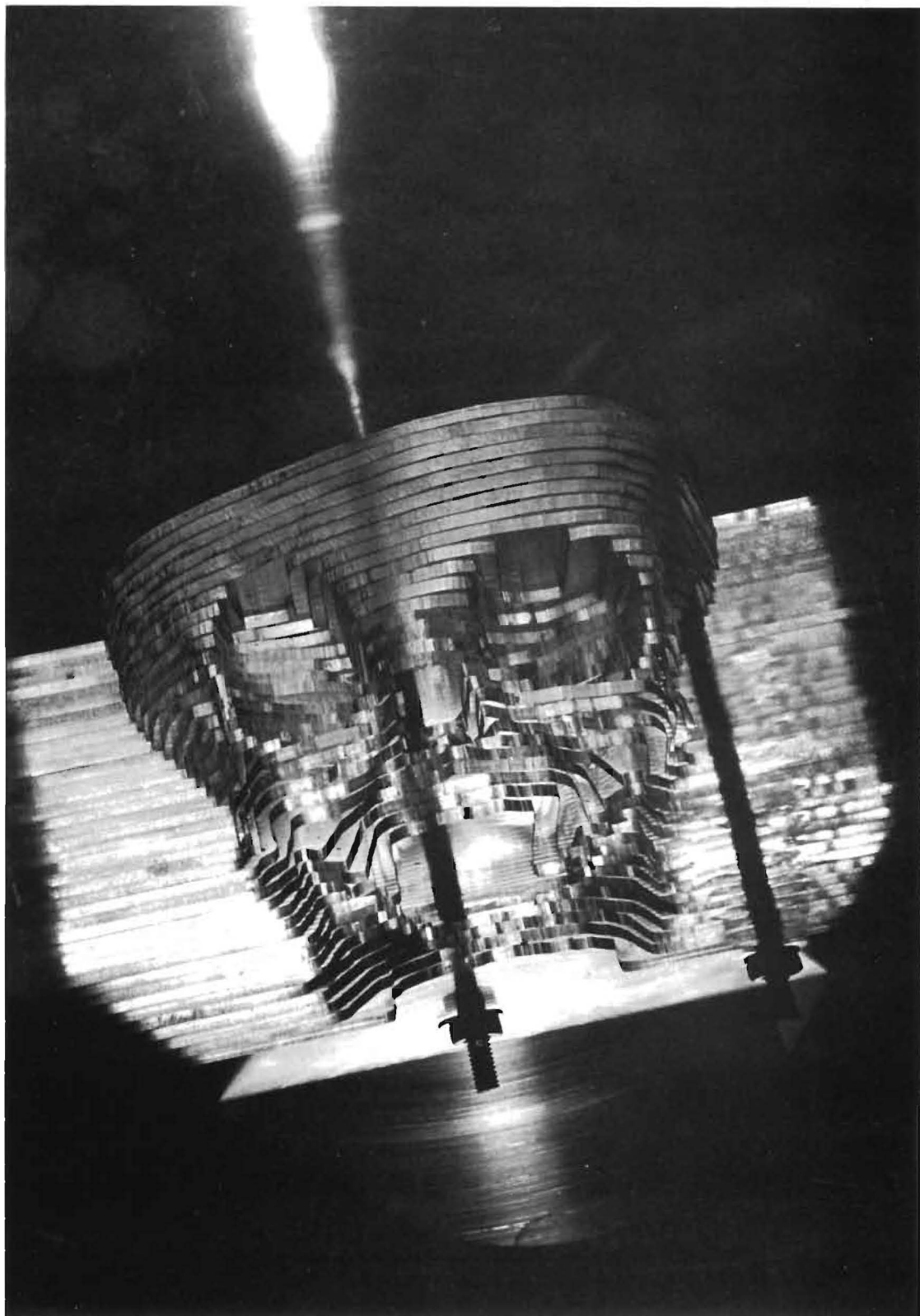
Technology Transfer

This Lucite three-dimensional model began as a series of CT scans. In addition to its eerie beauty, the model brings skeletal structural details out of hiding and minimizes the elements of surprise and chance in the work of craniofacial surgeon Jeffrey Marsh.

The technological roots of this development began more than a decade ago in the defense industry which pioneered computer-assisted design (CAD) for fighter aircraft. Michael Vannier, M.D., assistant professor of radiology, was an engineer for NASA before becoming a radiologist at the Mallinckrodt Institute of Radiology, Washington U. School of Medicine. Vannier and Marsh, with McDonnell Douglas Aircraft Co. engineer James O. Warren, developed the method of using McDonnell Douglas' interactive CAD programs to display contiguous, non-overlapping, 2mm CT "slices." The computer program can reconstruct the CT images to show, on a video monitor, various degrees of seven perspectives of both soft tissue and bone surfaces.

To prepare the surgeon even more thoroughly for the operation, Vannier and Marsh added an x-y plotter to the system. The plotter produces exact, life-size contours from each CT scan. The drawings are rubber-cemented to 2mm-thick Lucite sheets, which are then exactly cut with a scroll saw. The Lucite contours are then stacked up and bolted together to form an exact replica, in three dimensions, of the CT scans.

The surgeon can see, touch, and manipulate the craniofacial construction of the patient well before picking up the scalpel.



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