

UNIVERSITY OF MINNESOTA
MEDICAL
BULLETIN WINTER 1987



**Bone Marrow Transplants:
Reversing Symptoms of
Rare Genetic Disorders**

A PUBLICATION OF THE MINNESOTA MEDICAL FOUNDATION

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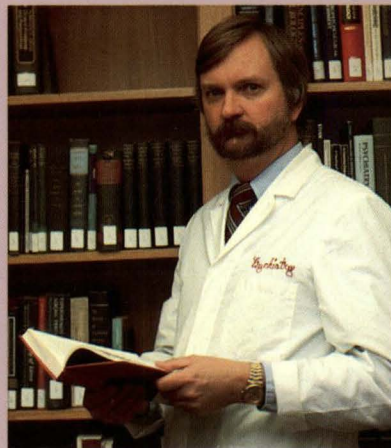
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The Minnesota Medical Foundation was founded in 1939 by a dedicated group of faculty members and medical alumni who saw the need for private support to build a strong future for the medical school. A non-profit organization, MMF raises and disburses funds for medical education and research at the University of Minnesota Medical Schools in the Twin Cities and Duluth.

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On the Cover: Dr. Chet Whitley with bone marrow transplant patient, Matthew Smith, and Matthew's mother, Debbie Smith, of Fort Worth, Texas. Photo by Nancy Mellgren.

The Minnesota Medical Foundation supports the research and educational missions of the University of Minnesota Medical Schools by encouraging private contributions.



Responsibilities And Rewards

Dickens' observation that "These are the best of times; these are the worst of times" certainly applies to the challenges facing physicians. The high level of sophistication of our knowledge of the science of medicine, and the lofty demands put upon us for human caring and social consciousness, place in our hands heavier responsibilities than we may have expected when we entered the profession.

As we contemplate how we will adapt to these expectations, we must admit that physicians have vitally important roles in society. At issue are the dimensions we can individually be expected to fulfill. Foremost, of course, must be our oath to maintain the sanctity of our responsibilities to each of our patients. Each of them should and does expect us to come to them with sufficient knowledge and wisdom to help solve their problems. It is this personal and human transaction which is the basis of our education and upon which we build experience.

Our faculty's responsibilities, therefore, are awesome. As faculty, we must create and be aware of the body of knowledge which constitutes the contemporary sciences of medicine. We must develop the skills to understand, cope with, and teach by example the ethical and cost-effectiveness issues of medical practice.

The foremost reward of being a physician has always been taking care of people. The smile of relief from a patient given the message of a good prognosis, the warm handclasp of confidence from a patient facing a life-threatening procedure, the pleasure of preventing a disease in a healthy child, the gratification that laboratory research may lead to prevention of a debilitating disease, and the satisfaction gained from efforts spent poring over lecture notes describing a difficult biological concept—all will lead to better practitioners collectively and bring us into an academy as never before.

The medical students are excited about the prospects of meeting these challenges. They have confidence that their roles in an improving health care system will be pivotal in its success and that this will bring them gratification. They are correct in their evaluation and expectation. Their teachers and their professional colleagues join them in this mission.

The joys of knowing that the efforts of physicians, students, and faculty lead to maintaining health, preventing disease, and alleviating suffering, while collectively moving ahead on the frontiers of knowledge, allow us to rise beyond the travails and tensions of short-term problems. Health is vital to a productive society. Medicine and the practitioners of its art and science provide the assurances that our society will be fit to fulfill its expectations.

We are blessed to be a part of these times more than a century after Dickens described the challenges of his era. We are all responsible today for creating tomorrow's history. We need to be up to the challenge.

David M. Brown, M.D.
Dean
University of Minnesota Medical School

An MMF grant enabled Dr. Whitley to purchase the laboratory equipment needed to develop a newborn screening program for MPS.



Giving Children A Future

Grants from the Minnesota Medical Foundation
have helped Dr. Chet Whitley in his
research into genetic enzyme deficiency diseases.

By Michael Moore

Chet Whitley was a senior at Carleton College in 1972 when he heard that researchers had for the first time successfully transferred an enzyme-producing gene into human cells in culture.

"At that time, I was taking a biomedical ethics course, and we had been discussing the future possibilities of genetic engineering; we had no conception that it would happen in the 1970s. The fact that it had just been accomplished was shocking, and it whetted my interest for doing this work myself. I developed a strong motivation to pursue medical applications of genetics," he says.

Now, 14 years later, Chester B. Whitley, Ph.D., M.D., is part of a team of physicians and researchers at the University of Minnesota Medical School who have succeeded in using bone marrow transplants to reverse symptoms of genetic enzyme deficiency diseases. This procedure could provide a prototype for gene transplantation, opening a new therapeutic avenue in medicine.

The Biggest Challenges

"I gained a great respect for biological research and an understanding of physicians from Thurlu Thomas, a senior

professor at Carleton," Dr. Whitley says. "His laboratory utilized an electron microscope and he would spend free afternoons teaching the basics of electron microscopy. He fascinated me with cell biology, which then motivated me to apply to graduate school at the University of Minnesota, and simultaneously to the medical school."

Dr. Whitley overcame an undergraduate distaste for genetics—"I certainly did not have an intrinsic grasp of genetics and took a long time to understand the basics—to earn a 4.0 average in the genetics component of the master's program in genetics and cell biology. He was accepted into the Ph.D. program, and in 1977 he received his Ph.D. in human biochemical genetics. Perseverance paid off for him in gaining acceptance to the University of Minnesota Medical School in 1976. "I think the things that are hardest in life, and present the greatest challenge, are the things to which one must apply the greatest effort and from which, in turn, one will reap the greatest personal reward—that's always been true for me," he says.

Dr. Whitley applied himself to medical school, receiving a Minnesota Medical Foundation Student Research Fellowship in 1979, and a Medical Student Achievement Award

from the Minnesota Medical Foundation in 1980. He received his M.D. in the pediatrics tract in 1980, and went on to serve his internship and residency in the university's department of pediatrics, as well as a skeletal dysplasia fellowship with Dr. Robert J. Gorlin in the department in 1984.

Now on the university faculty as an assistant professor of pediatrics and a geneticist with the Dight Laboratories for Human Genetics, Dr. Whitley is the only board-certified clinical biochemical geneticist in the five-state area, making the university a vital resource for diagnosis of congenital enzyme deficiency diseases.

Skeletal Dysplasias

Much of Dr. Whitley's research focuses on families with disorders of bone and cartilage growth and development. Called skeletal dysplasias, this group of disorders includes achondroplasia, the most common dwarfing disease; osteogenesis imperfecta, or brittle bone disease; and more than 30 lysosomal storage diseases, in which the absence of one of the hydrolytic enzymes interferes with intracellular metabolism.

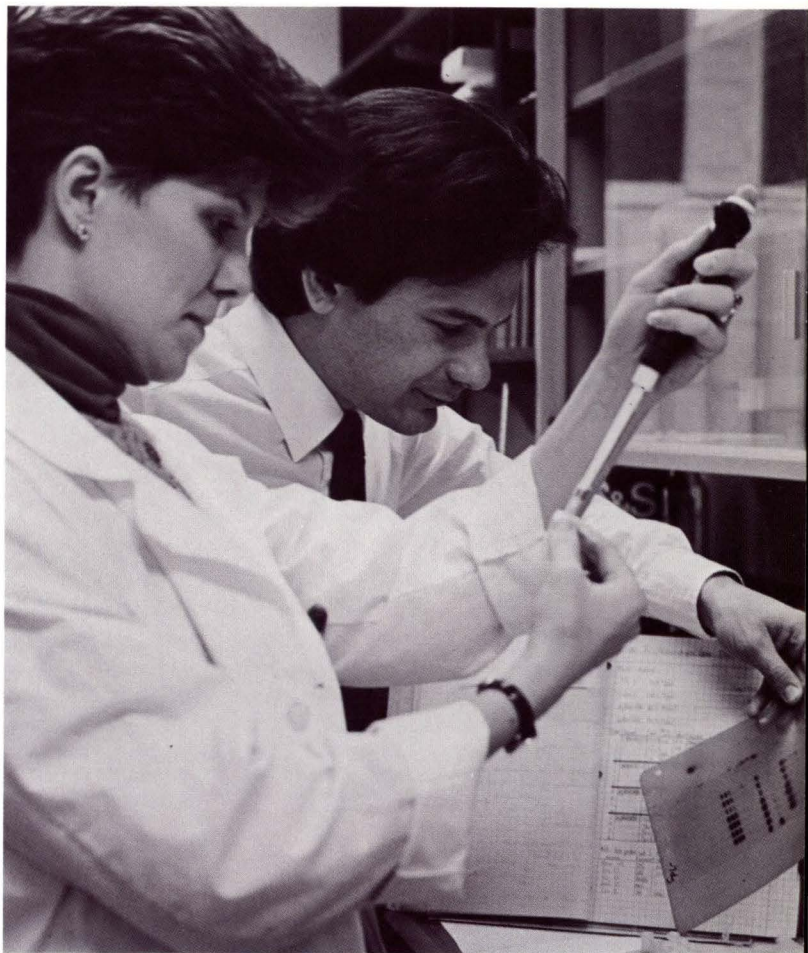
In 1985 Dr. Whitley received grants from the Minnesota Medical Foundation and the Viking Children's Fund to investigate the hypothesis that mutations of the type II procollagen gene cause at least some of the skeletal dysplasias. Procollagen is the precursor of collagen, the major protein involved in cartilage and bone formation.

Dr. Whitley found that there is very little variation in the procollagen gene's composition among the Caucasian individuals he and graduate students Carolyn Vitek and Molly Fee have tested so far. This should make it easier to detect mutations of DNA within this gene in affected individuals. If a mutation is detected and found to be a marker for individuals with skeletal dysplasia, it could enable prenatal diagnosis and may eventually lead to treatment.

Vitek, Fee, and Dr. Whitley have compared the probes used by their laboratory and two others to study the type II procollagen gene. They found that each laboratory had identified the same DNA fragments, or restriction fragment length polymorphisms (RFLPs), on the gene. This correlation confirmed that the probes and RFLPs are useful tools for evaluating potential type II procollagen defects. Vitek's task is to perform the RFLP analysis on cells from each individual, and then to piece together a picture or "restriction map" of as much of the normal gene as possible for comparison with results of skeletal dysplasia patients.

The RFLP analysis should be especially informative in examining genetic material from families affected by skeletal dysplasia. Three such families have been analyzed so far without finding a shared defect that would confirm that the gene is related to the disease. But Vitek is determined and confident that such a "linkage analysis" will be helpful as it has been for other genetic conditions such as Huntington disease and cystic fibrosis. "This gene is just too heavily involved in bone formation and growth; there has to be a defect that we just haven't gotten to yet," she says.

Vitek says her strong interest in human genetics and the atmosphere created by Dr. Whitley are the major reasons she has persisted in the slow, difficult laboratory work. "He's always so excited about science, and so willing—in spite of his clinical duties, writing, and other research—to share ideas and discuss what I'm doing in the lab. He creates a special atmosphere for working and learning," she says.



Graduate student Carolyn Vitek is studying the type II procollagen gene in Dr. Whitley's laboratory.

Last year the university established the Minnesota Skeletal Dysplasia Program, an alliance of geneticists, radiologists, pathologists, orthopedic surgeons, biochemists, molecular biologists, and clinicians. The program includes the Skeletal Dysplasia Clinic in the department of pediatrics, a collaborative effort of Dr. Whitley; Robert J. Gorlin, D.D.S., M.S., regents' professor of oral pathology and genetics; and Leonard O. Langer, clinical professor of radiology. Dr. Whitley's office maintains a registry of affected families and circulates a weekly newsletter to interested researchers, clinicians, affected families, and organizations such as the Little People of America, March of Dimes Foundation, and Human Growth Foundation.

A Long Road to Minneapolis

Matthew Smith is giving visitors "high fives" from his crib in the University of Minnesota Variety Club Children's Hospital, and he looks healthier at 22 months than he has at any time in his short life. His mother, Debbie Smith, of Fort Worth, Texas, says Matthew has spent almost half his life in hospitals.

"He was sick a lot as an infant with respiratory and gastrointestinal problems; just a lot of systemic illness," says Smith, an adult intensive care unit nurse. "His symptoms looked like cystic fibrosis, but extensive tests ruled that out. Then his gastroenterologist, Dr. Robert Squires, thought it resembled Hunter's, one of the mucopolysaccharidosis (MPS) syndromes. A urine test confirmed that it was MPS, but a blood test showed that it was actually one of the other MPS syndromes, Sanfilippo syndrome type B." (Editor's note: Sanfilippo syndrome takes its name from Dr. Sylvester J. Sanfilippo, the pediatrician who was first to recognize the disorder while training at UMHC.)

It was December 1985, and it marked the beginning of a long journey—physically and mentally—for Matthew, Debbie, her husband David, and their two other children, Nathan and Becky. They heard two opposing viewpoints from their physicians: Some said they should enjoy Matthew while they had him, which could be anywhere from 5 to 20 years, and make him as comfortable as possible as he died. But others said bone marrow transplantation seemed to be helping some children with MPS, and although there was about a 10 percent risk of death, it was really the only chance they had of giving Matthew a normal life.

The Smiths went to St. Louis University Medical School for a second opinion. "They confirmed the diagnosis and told me about the work Dr. Chet Whitley was doing with the bone marrow transplantation team at the University of Minnesota," says Debbie Smith. "Then they encouraged me to copy everything in their library about Sanfilippo so we would have the information to make a decision."

After reading of the steady degeneration and early death caused by Sanfilippo syndrome, the Smiths decided to give Matthew a chance at life. "I had to look ahead 20 years for Matthew, and not just think how nice it is to have him here with us now," says Debbie. "Even if we lose him, I'll know that we gave him his only chance at a healthy life," she adds quietly.

Nathan's bone marrow was a perfect match for Matthew, and a transplant was performed November 13. Nathan and Becky returned home with their father to have a stable home life during the month-long wait for the outcome of Matthew's transplant. Debbie Smith spends days and nights in Matthew's room, not wanting him to wake up terrified and alone. "We've had so much support from my co-workers and our friends and family at home, and the staff here has been so caring," she says.

Debbie Smith is determined to not only do what is best for Matthew, but to also make an impact on diagnosis and treatment of other children with MPS syndromes. "I'd like to spare every parent the pain of not knowing what is wrong with their child, and then the agony of not having any hope for the future. Why can't there be a nationwide newborn screening test for MPS, just like the one for PKU (phenylketonuria). And there should be more genetic counseling

available to families affected by MPS," she says.

Blood tests for the enzyme that is missing in Sanfilippo syndrome showed that Nathan is not a carrier, but Becky is. "Becky's a very intelligent 7 year old and she understands what it means to be a carrier," Debbie Smith says, explaining that Becky has been moved up in school to the third grade and has read all the medical literature on MPS syndromes.

"My aim is to help any way I can to improve the future for the thousands of children with MPS," she declares. Her quiet but firm conviction leaves no doubt that she will succeed.



Dr. Whitley examines Matthew Smith, a patient with Sanfilippo syndrome who received a bone marrow transplant.

Graduate student Molly Fee makes use of state-of-the-art equipment in her laboratory research.



Lysosomal Storage Diseases

Much of Dr. Whitley's graduate work focused on lysosomal storage diseases, which were just beginning to be understood at that time. "Researchers were recognizing that lysosomal storage diseases resulted from common mechanisms; each 'carrier' would have one normal gene (for a lysosomal storage enzyme) but would also have one mutant gene. If two carrier parents had a child, there was a 25 percent chance the child would receive a mutant gene from each parent and would therefore be unable to make the normal lysosomal enzyme. The child, lacking the normal enzyme, would not be able to convert substance A to substance B. The abnormal accumulation of toxic substance A in lysosomes, for example a mucopolysaccharide, impairs various cell functions resulting in multiple aspects of the disease."

Dr. Whitley's involvement in lysosomal storage disease research has been "an affair of the heart in many ways," he says. He met his wife Kathleen while she was attending medical school at the University of Minnesota and working in the laboratory with Robert Desnick, Ph.D., M.D. and William Krivit, M.D., Ph.D. in the department of pediatrics.

Dr. Desnick was working on the concept of enzyme replacement for lysosomal storage diseases, and he offered Chester Whitley a chance to join his laboratory. The rest is history, including the Whitleys' marriage, his work at the university, and his wife going on to become director of the division of general internal medicine at Hennepin County Medical Center.

"My philosophy of science and medicine—the way I approach an experiment, talk to a patient, and teach a graduate student—was certainly influenced by Bob (Desnick)," Dr. Whitley says. "He was an important men-

tor. He was another Minnesota product, completing a Ph.D. in the department of genetics and cell biology at the University of Minnesota, then medical school and a residency in pediatrics here. He is now recognized as one of the pre-eminent scientists in this discipline." Dr. Desnick is now with Mount Sinai Hospital in New York City.

Dr. Whitley realized when working with Dr. Desnick that "there was so much potential for diagnosing and treating patients based on an understanding of genetics. But I also appreciated that this kind of work required someone with medical training. That really rekindled my interest in medicine and made me realize that it would be worth the four to seven years of medical training.

"I considered doing an abbreviated residency but Kathleen, my wife and colleague, encouraged me to pursue full training. It came down to the fact that I really wanted to treat patients, to be able to apply the tremendous advances I saw happening in research and see it come to fruition for individuals."

Bone Marrow Transplantation

Dr. Whitley's collaboration with Dr. William Krivit, professor of pediatrics, and the pediatric bone marrow transplant team is giving him that opportunity. The team has now performed bone marrow transplants on 12 children with lysosomal storage diseases, six of which have a form of mucopolysaccharidosis (MPS) known as Hurler syndrome. Between 500 and 1,000 children are born in the United States each year with one of the 12 identified MPS syndromes.

MPS causes devastating physical and mental degeneration which may become apparent anywhere from just after

birth to the preschool years. Some of the syndromes cause obvious physical deformities, but others cause only systemic problems that can be very difficult to diagnose. Treatment by injection of purified enzyme or infusion of normal white blood cells has been tried unsuccessfully. Therefore, care for these children has tended to be conservative and focused only on keeping the child comfortable until an early death occurs, usually before age 10 for Hurler syndrome.

Some physicians and researchers have criticized bone marrow transplantation as being too risky in relation to the expected benefits for children with MPS. Critics doubt that the enzyme produced by the donor marrow will be able to cross the blood-brain barrier to counter the mental retardation caused by MPS.

"Because of my medical education, I really am much more conservative than I was before," Dr. Whitley says. "Almost anything we do in medicine carries some risk, and one must appreciate that even the simplest, routine procedure may have devastating consequences. On the other hand, having the experience of seeing what these genetic diseases do to an individual if they aren't treated, I think it is reasonable to try an unusual and very risky treatment if that is the only way we can give them a chance to survive and live a reasonably healthy life."

Ten of the children with lysosomal storage diseases given bone marrow transplants are alive and the symptoms of their disease have regressed, but the quality of their life is widely varied depending on the severity of their disease before transplantation.


Five of the children have Hurler syndrome, a deficiency of the enzyme alpha-L-iduronidase. The enzyme normally degrades and helps recycle materials within the lysosomes of each cell. Without the enzyme, the cells become bloated and cause enlargement of internal organs, deafness, clouded corneas, dwarfism, scoliosis, coarsening of facial features, and progressive mental retardation. Life expectancy is about 10 years.

Pediatrics professor Dr. William Krivit pioneered application of bone marrow transplantation for Hurler syndrome after visiting physicians in England who were investigating the therapy. The UMHC bone marrow transplantation team, headed by professors Norma K.C. Ramsay, M.D., and John H. Kersey, M.D., performed its first bone marrow transplant on a Hurler patient four years ago. Follow-up testing on that patient and others treated since continues to show reversal of symptoms, with the exception of the skeletal problems, says Dr. Whitley.

Dr. Whitley is optimistic that mental degeneration has been halted in the Hurler patients. His tests have shown that MPS storage material has been maintained at normal levels, rather than increasing, in the cerebrospinal fluid of the children treated, which strongly indicates that metabolic correction has been obtained in the brain.

As an offshoot of his screening tests in families of children with Hurler syndrome, he developed a test that can detect the level of the enzyme alpha-L-iduronidase in a person's tears. It allows him to quickly confirm a diagnosis and also to determine if a normal individual is a carrier of the disease.

Dr. Whitley says the team's goal now is to diagnose MPS as soon as possible after birth and transplant those children before the degenerative disease process begins. "The problem now is that by the time the children are diagnosed they already have many features of the disease, some of which—especially the abnormal bone growth and earliest brain damage—don't appear to be reversible," he says.

Dr. Whitley has just begun to work on developing an early diagnostic test for MPS. The disease was given its name because children with MPS excrete mucopolysaccharide in their urine. Dr. Whitley hopes to develop a routine urine screening test that could be used, like the state-mandated test for phenylketonuria (PKU), to detect newborns with MPS. He recently received a grant from the Minnesota Medical Foundation to purchase the laboratory equipment needed to begin to develop such a newborn screening program. The equipment will allow Dr. Whitley and his colleagues to continue their advances toward the day when children with genetically transmitted errors of metabolism will be able to live normal lives. 

Michael Moore is a science writer for the University of Minnesota Office of Health Sciences Public Relations. Photos by Nancy Mellgren.

"It came down to the fact that I really wanted to treat patients, to be able to apply the tremendous advances I saw happening in research and see it come to fruition for individuals."

Teamwork Gives Quads Good Start



University of Minnesota doctors and nurses share the excitement of the birth of the McNicholas quadruplets.

By Jean Murray

All together, they weighed just short of 16 pounds, but the arrival of the tiny McNicholas quadruplets marshalled a small army of University of Minnesota doctors, nurses, and support personnel to make sure their entry into the world was as safe and healthy as possible.

"Teamwork" is the word heard most often when talking to the attending physicians. And the teamwork included not only the doctors and nurses. Key to delivery of the four healthy infants was the extraordinary care taken prior to the birth by their mother, Phyllis, with the support of her husband, Kevin.

The two boys, Connor Preston and Ryan Philip, and two girls, Lindsay Caitlin and Brynn Erin, were born October 16 at University of Minnesota Hospital. Their birth weights ranged from 3 pounds, 14 ounces to 4 pounds, 1 ounce. They are the first quadruplets born in Minnesota since 1975, and none are identical.

Kevin and Phyllis McNicholas already had three sons at home—Kevin, 8, Sean, 6, and Brendan, 2—and are prepared for a household full of children. Phyllis is a former obstetrics

nurse, and Kevin is manager of an agricultural chemicals firm.

The McNicholas family learned in April that Phyllis was carrying quadruplets. Because of the high risk for premature labor with a multifetal pregnancy, she was hospitalized for eight weeks before the delivery under the excellent care of university obstetrics nurses and Dr. Preston Williams of the obstetrics and gynecology department. Dr. Williams specializes in multiple births, and delivered Minnesota's last set of quads, the Bergquists of Mountain Iron, in 1975.

"It was very much a team endeavor," says Dr. Williams. "There was a major commitment made to the success of the pregnancy on the part of Mr. and Mrs. McNicholas and by all the staff. We all wanted the pregnancy to continue for an optimal time."

During her weeks in the hospital, Phyllis was on modified bed rest. She could take one walk a day, shower, and visit the cafeteria with her family, but for the most part stayed in bed. She formed a lasting relationship with the staff. They not only monitored her physical condition



Kevin and Phyllis McNicholas with the four new additions to their family.

and met her nutritional needs, but helped keep her in a healthy frame of mind over the long weeks of waiting with conversation and constant encouragement.

The University of Minnesota Hospital had been highly recommended to the McNicholas family for obstetric care, and they are delighted with the choice. "We can't say enough good things about the U," says Kevin. "Everybody was just great."

Phyllis, who had experienced two previous miscarriages, had been taking medication to improve the quality of ovulation. The diagnosis of quads was made eight to ten weeks into the pregnancy. It was decided early-on that the babies would be delivered by Caesarean section—the three older McNicholas boys had also been Caesarean deliveries.

As the weeks of bed rest continued, plans for the births intensified at the hospital. Over 50 doctors and nurses, dubbed the "Quad Squad," volunteered to be on call 24 hours a day. Staffs from obstetrics, pediatrics, anesthesiology, and the neonatal intensive care unit were all in a

state of readiness. "We traded on our experience of 11 years ago with the Bergquist quads," says Dr. Williams. "It was a case of many departments working together, a marvelous representation of the commitment of the staff working in a cooperative effort."

The quads were born during the 34th week of the pregnancy. Dr. Ted Thompson, head of the hospital's neonatal unit, was thrilled with the healthy condition of the infants. "The mother's motivation to keep the babies inside of her was the key," he says.

Each baby had its own pediatric team in the delivery room, consisting of a doctor and two nurses. Labor was not induced, and Phyllis began experiencing contractions about 3:30 a.m. The babies were born at 3:15 in the afternoon, and Phyllis remained awake during the procedure with Kevin beside her. Dr. Bruce Work, head of obstetrics and gynecology at the university, delivered the quads, since Dr. Williams had been called out of town on a family emergency.

"It was a very orderly process," says Dr. Work. "Everyone was very organized. From the standpoint of management of the babies, it was like four separate births. All the departments involved were prepared."

Because of their small sizes, the quads were put in the neonatal intensive care unit, but were pink and crying right away, due, according to Dr. Thompson, to the willingness of Phyllis McNicholas to endure eight weeks of bedrest to keep the babies in the womb.

And due, as well, to a "Quad Squad" dedicated to giving Connor, Lindsay, Brynn, and Ryan the best possible start in life.



Lindsay, Ryan, Brynn, and Connor McNicholas.

Bulimia: A Serious Concern

The University of Minnesota Eating Disorders Program is a national leader in research and treatment.

"I am terribly afraid of becoming fat. I am sure that if I quit vomiting, I will gain lots of weight and I couldn't stand that."

"I think about food all the time. Food is the most important thing, the only thing, in my life."

By Karen Thompson

For these two young women, the simple act of eating has become intertwined with their emotions and self-expression and has taken on meaning beyond that of nourishing their bodies. These thoughts are common in patients with bulimia.

Bulimia is an eating disorder characterized by binge-eating followed by self-induced vomiting or laxative abuse to prevent weight gain or to promote weight loss.

First described in detail in about 1979, bulimia is a more prevalent and serious disease than many health professionals think, according to James E. Mitchell, M.D. and Elke D. Eckert, M.D., associate professors in the department of psychiatry and co-directors of the University of Minnesota Medical School Eating Disorders Program.

The Eating Disorders Program has evaluated more than 1,500 patients in the last five years. Currently the program evaluates 8 to 10 patients each week, and experiences about 500 patient visits each month. According to Dr. Eckert, more bulimic patients visit the center than any other similar facility in the country, likely due to its intensive outpatient treatment program. It incorporates both clinical and research components and includes patient evaluation, education, psychotherapy, and, when indicated, pharmacotherapy.

To describe the relationship between bulimia and anorexia nervosa, Dr. Mitchell drew two overlapping circles, one much larger than the other, and explained that the overlap creates three groups (See Figure 1):

1. Anorexia nervosa patients who become too thin by simply starving themselves or restricting their food intake. They are called "restrictor" or non-bulimic anorexics and comprise about 50 percent of patients with anorexia nervosa.
2. Bulimics who are at normal weight who binge-eat and then vomit or abuse laxatives to control their weight.
3. Anorexia nervosa patients who also get too thin but who find they can't control their appetite so they binge-eat and then vomit to control their weight. They are called bulimic anorexics. The symptoms, behavior, and even family histories of bulimic anorexics resemble normal weight bulimics more than they do restrictor anorexics.

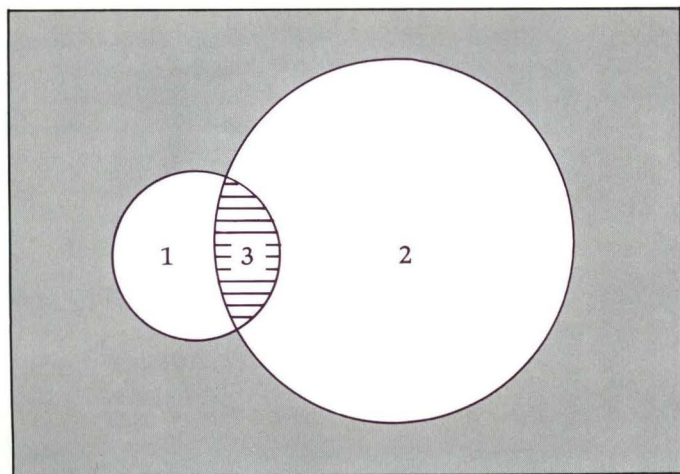
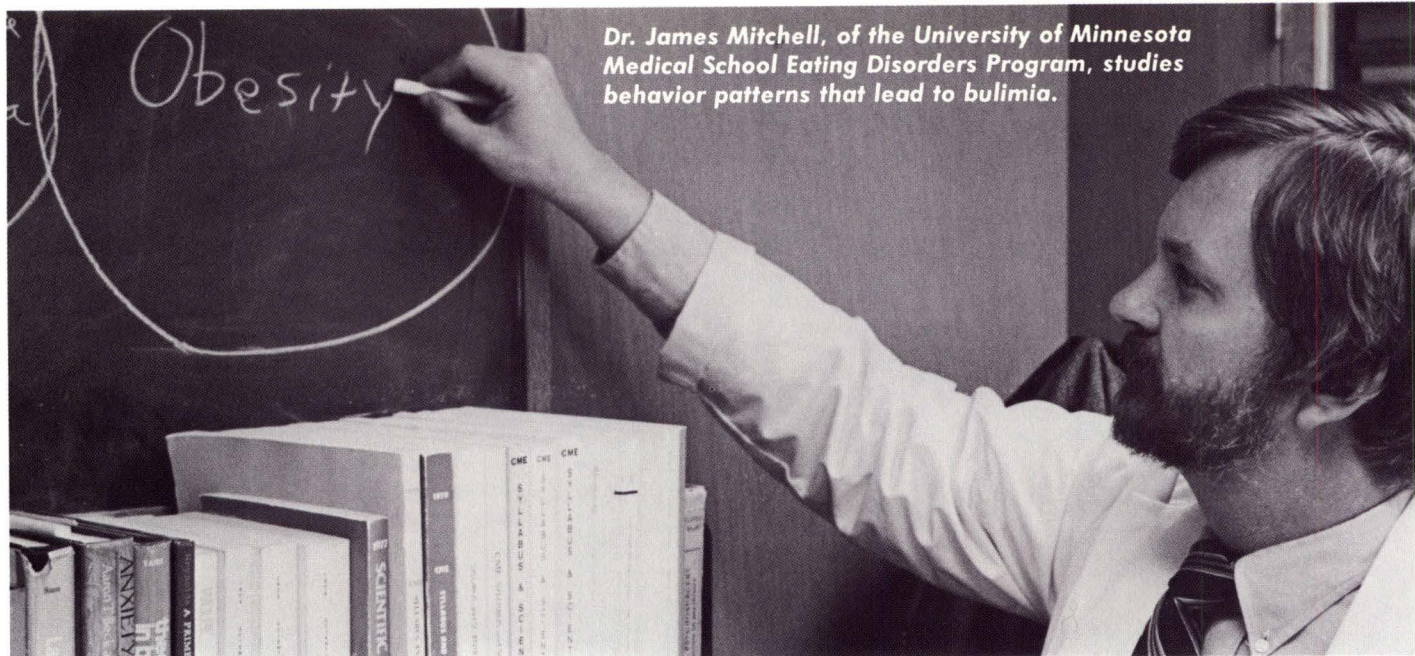


Figure 1. The relationship of non-bulimic anorexia nervosa, normal weight bulimia, and bulimic anorexia nervosa.



Dr. James Mitchell, of the University of Minnesota Medical School Eating Disorders Program, studies behavior patterns that lead to bulimia.

Bulimia is more prevalent than many people think. "If you look at people with seriously impaired eating behaviors, the ones who binge-eat and vomit regularly," says Dr. Mitchell, "the prevalence is about 1 to 4 percent of females in the age group at risk. This means that between one in 100 and one in 25 women between 15 and 25 years of age develop full-blown bulimia, making it far more common than most other illnesses."

Unlike patients with anorexia nervosa, bulimic individuals show few visible signs. The diagnosis can be missed unless the doctor asks questions about the patient's eating habits.

According to Dr. Eckert, few patients will volunteer information about their eating habits and bulimic patients often present with other complaints. For example, a gynecologist might see a normal weight bulimic who complains of irregular menstrual periods.

It's not uncommon for a bulimic woman to have unexplained lab abnormalities. Her doctor might pursue a metabolic evaluation for abnormalities, not suspecting that the woman is abusing laxatives or vomiting to control her weight. "Many bulimic patients have undergone fairly detailed metabolic evaluations before they arrive at our clinic," Dr. Mitchell says.

Both Drs. Eckert and Mitchell say that bulimia is increasing in prevalence. Dr. Mitchell says it is due, in part, to a cultural pressure for thinness. "If you survey a population of high school girls, you find that at any given time the majority of them are attempting weight loss. There is clearly a lot of cultural emphasis on thinness."

Bulimia and anorexia nervosa are found almost exclusively in Western industrialized societies, where there is plenty of food. "This is a cultural phenomenon, very much a symptom of our society," says Dr. Mitchell. "It is possible that, for a long time, only people who were psychologically vulnerable developed these diseases. But now we may actually be causing normal people to develop this syndrome because of cultural pressures."

This emphasis on thinness is occurring in a society that is actually becoming heavier. Actuarial statistics indicate that over the last 20 years females under 30, on the average, have become heavier.

Physicians find the disorder frustrating to treat because it is clear that a major determining variable behind its growth is cultural. Dr. Mitchell says, "As health care providers, we haven't been trained to address this kind of widespread cultural problem. And the usual tools of medicine are not as useful as they are with most illnesses.

"You can tell a young patient, 'You're really not overweight, you look fine, you really shouldn't be dieting, this is a good body weight for you,' and she walks out the door and everything she sees on TV or in advertisements tells her otherwise. You're fighting a culture and it's very hard to do that."

Bulimia has serious medical effects on several systems of the body (See Table 1).

Fluid and electrolyte abnormalities can be profound. About 45 to 50 percent of women with bulimia develop at least modest fluid and electrolyte abnormalities and about 5 percent will have serious abnormalities necessitating hospitalization or emergency fluid replacement.

Table 1. Major Medical Complications of Bulimia

Renal	Elevated BUN (dehydration)
Gastro-intestinal	Swelling in salivary gland Elevated serum amylase Gastric dilatation, rupture, esophageal rupture
Dental	Decalcification
Fluid & Electrolyte	Dehydration Alkalosis Hypochloremia Hypokalemia
CNS	Abnormal EEG
Endocrine	Impaired TRH responsiveness Pathological growth hormone responsiveness to glucose Elevated basal prolactin Positive dexamethasone suppression test

Laxative abuse and diuretic abuse can be especially damaging, causing constipation, cathartic colon, gastrointestinal bleeding, fluid retention, loss of protein through the stool, weakness, dizziness, and dehydration.

Binge-eating and self-induced vomiting can interfere with social relationships and cause job problems (missed work, inefficiency), financial problems (because of food expense), and legal problems (as a result of shoplifting).

Feelings of depression, shame, anger, and self-disgust are common. About 80 percent of patients who present for treatment of bulimia have significant symptoms of depression: sleep problems, low self-esteem, memory impairment, low performance.

Many consequences of the behavior tend to make the behavior worse. It's a cycle that seems hard to break.

"At first I used to binge-eat and throw up only when I was under stress. But now I just do it at the same time every day. I stop and buy food on the way home from work, lock myself in my apartment, and eat."

How does the cycle get started? Dr. Mitchell explains: "Someone with bulimia generally tries to fast after they binge-eat and vomit because they're afraid they'll gain weight. They restrict their caloric intake for 18 to 20 hours and of course become very, very hungry and more likely to binge. They get into a see-saw of bingeing and vomiting and fasting rather than eating regular meals. There is also evidence that protracted fasting and bingeing may reset the patients' metabolic rates lower so they are more likely to gain weight on smaller amounts of food."

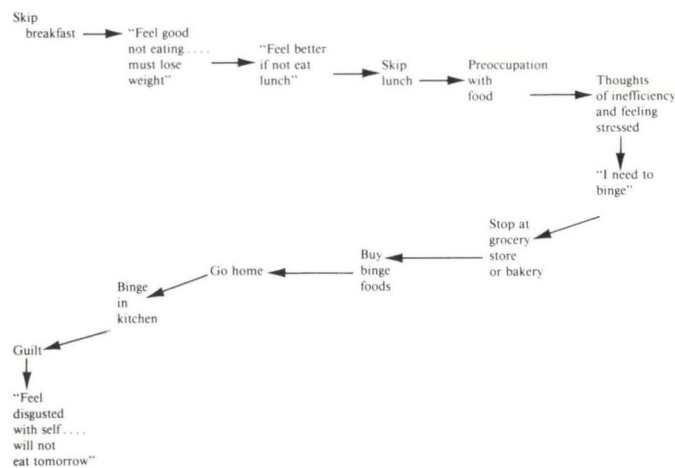


Figure 2: Behavioral chain leading to binge-eating and vomiting.

Bulimia can be treated successfully using a highly structured, cognitive behavioral approach, sometimes in combination with antidepressant medication. The syndrome can usually be treated on an out-patient basis. In-patient treatment is rarely indicated.

Of the drugs used experimentally to treat bulimia, antidepressants appear to work best. They significantly decrease the frequency of binge-eating and vomiting in more than 80 percent of bulimic patients.

Psychotherapy most often involves cognitive-behavioral techniques: getting patients to examine their thoughts and beliefs about body, weight, and eating behavior, and helping them modify these beliefs into more realistic ones.

Most psychotherapy programs are designed to change the eating behavior and to teach such adaptive skills as meal planning and stress management.

The University of Minnesota Eating Disorders Clinic uses both pharmacotherapy and psychotherapy in its intensive two-month out-patient program, now in its fifth year of operation. The program includes sessions on nutrition and meal planning, medical complications of the disease, designing a plan of action, stress management, assertiveness training, family systems, cognitive restructuring, relapse prevention, and group psychotherapy.

Dr. Mitchell stresses that because bulimia is difficult to spot from visible signs, "Every young woman should be screened for bulimia as part of the patient history and routine physical exam."

"Because alkalosis, low serum chloride, and low serum potassium are highly suggestive for both anorexia nervosa and bulimia," says Dr. Eckert, "a serum electrolyte check should also be done."

Some bulimia screening questions follow, compiled with the help of Drs. Eckert and Mitchell:

- Tell me something about your eating habits.
- What do you think about your weight? Do you worry a lot about it?
- Do you sometimes have problems with binge-eating?
- Do you see yourself as bigger than other people see you?
- Have you recently lost a lot of weight? If so, why?
- Are you afraid of losing control of your food intake?
- Do you ever make yourself vomit in an attempt to lose weight?
- Do you ever use laxatives to control your weight?
- Do you ever use water pills to lose weight?
- Very often people who binge-eat and then vomit find that food becomes expensive so they start stealing it. Have you experienced trouble in this area?

Although prevalent and serious, bulimia is quite treatable. Diagnosis is the key. "Have a high index of suspicion of bulimia among young female patients," says Dr. Mitchell, "and screen for it routinely. If you work with young women, ask them about their eating behaviors as a routine part of health screening, just like you'd ask about drug use."

Karen Thompson is a freelance science writer based in Minneapolis.

Photo by Rick Verner, Courtesy of Minnesota Daily



Arthur L. Caplan, Ph.D., new director of the Center for Biomedical Ethics

Asking Questions, Finding Answers

The University of Minnesota Center for Biomedical Ethics is addressing ethical dilemmas in medicine that were unheard of a few years ago.

By Jean Murray

"New medical technologies developed during the last 25 years have created hitherto unprecedented ethical problems for medicine and society. On the one hand, the machinery to reinflate lungs, restart hearts, fight infection, transplant organs, even replace whole or parts of organs with artificial ones has given us the almost miraculous power to prolong life. On the other hand, the burden associated with the advance of medical technology is the ability not to sustain life in the full but instead to prolong death.

"Moreover, these technologies and the providers who offer the services are expensive. New medical technologies are being blamed in part for soaring medical costs and, given current cost containment programs, the question arises: *How are these scarce resources to be allocated and by whom?*"

The University of Minnesota Center for Biomedical Ethics is addressing these ethical dilemmas, as described above in a brochure for the center's lecture series: "Health Decisions '86: Medical Technology and Moral Concerns." Questions that could not have been formulated 25 years ago are being asked, issues are being discussed, and answers are being sought.

The center was created in 1985 as the result of a 20-member task force formed to look at biomedical ethics and how the subject was being handled at the university. John Wallace, assistant vice president of academic affairs, and Dr. Shelley Chou, professor and head of the department of neurosurgery, chaired the task force. Dr. Paul Quie was named as the first director of the center.

The Northwest Area Foundation recognized the need for such a center, and provided the initial support to fund the effort. The three-year funding will end in April of 1988, and the center is seeking legislative support to maintain and expand the work being done.

The goals and objectives of the center are spelled out in its mission statement, which reads: "The general mission of the Center for Biomedical Ethics at the University of Minnesota is to foster interdisciplinary discussion and study related to ethical issues and dilemmas in health care. The center coordinates education, research, and service activities which involve the participation of the health sciences, the humanities, and the social sciences. It serves university students, staff, and faculty; practicing health professionals in the community; health care users; professional organizations and researchers in the health care field; and the general public.

"The Center attempts to enhance and support existing programs related to biomedical ethics by providing opportunities for students and others to work with center personnel on education and research projects as well as interact with community organizations and with bioethical activities and resources at the national level."

Activities

Center activities during 1986 included student educational efforts, the granting of seed money and post-doctoral fellowships for research, and lecture series targeted toward both the community and health care professionals.

"It is clear . . . that the system is going to be confronted with a big challenge soon of elderly people, chronically ill people, people who survive acute medical intervention, but who need dental care, or who need social support in the home . . . what is the system going to do in response to that?"

— Arthur Caplan

With assistance from the center and its advisory council members, student educational efforts were expanded: medical school courses in biomedical ethics continue to be offered; the law school initiated a new course addressing health care issues; health sciences students worked with the center to plan a workshop regarding economics and health care for the disenfranchised (see accompanying article); a health sciences student group and an all-university student group were created to provide input into the center.

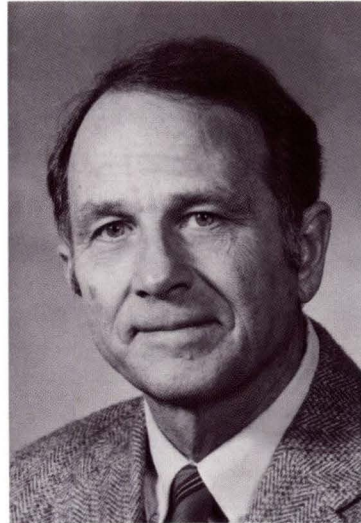
In addition to participation in curriculum activities in ethics, the center this past year provided seed money and post-doctoral fellowships for research and scholarships in topics related to biomedical ethics (see accompanying list of awardees).

In its first year, the center sponsored a symposium in collaboration with the Hubert H. Humphrey Institute entitled "AIDS: Medical Facts, Social Challenges, Ethical Dilemmas," attended by approximately 360 people.

The first community education series, co-sponsored by the Bakken Library of Electricity in

Life, was held between May 15 and July 24. Entitled "Ethical Dilemmas in Health Care for the Elderly," the series addressed such subjects as: Care and Feeding of the Terminally Ill; When Children Become Parents to Their Parents: Alternatives in Care for the Elderly; and Live and Let Die: A Look at Advance Directives.

A second series held in October and November, called "Medical Technology and Moral Concerns," explored biomedical ethics issues from the perspective of producers, providers, consumers, ethicists, the media, and public policy analysts.



Dr. Paul Quie

Acting Director Dianne Bartels has been coordinating the many efforts of the center since Dr. Quie left in June for a sabbatical in West Germany. She views the center as an evolving, expanding force in the community where people both inside and outside of the academic setting will be able to bring their questions and explore the issues.

"Institutions are vehicles for the distribution of the benefits and burdens of social life, and it is the function of the principles of justice to determine fair and equitable assignment of rights and duties and fair and equitable distribution of benefits and burdens."

— John Rawls

In October of 1986, Arthur L. Caplan, Ph.D., associate director of The Hastings Center: Institute of Society, Ethics and the Life Sciences and a renowned medical ethicist, was named permanent director of The Biomedical Ethics Center. Caplan will begin work at the university on June 1, 1987.

Said David Brown, M.D., dean of the medical school, "The issues involved in biomedical ethics are becoming increasingly complicated and difficult. Dr. Caplan has the background, the ability, and the vitality to deal with them optimally."

In December, Dr. Caplan addressed a group of health care professionals and community members at the Bakken Library. In his talk, entitled "What is the Role of Biomedical Ethics in Health Care Today?" Dr. Caplan outlined his goals for the Center for Biomedical Ethics at the University of Minnesota:

Education

My personal hope for the center is that it can do four things.

First, that it can expand educational offerings at the university. I would like to see that happen in a number of ways. One is the ultimate goal of getting required time in the medical school in the first year, and somewhere in the clinical rotations, for ethics.

The second thing I would like to see in terms of education in the medical school is more interdisciplinary work and interconnection with what is already going on. In biomedical ethics there are many courses being offered, and it seems to me they can be linked up and made to form a more coherent package than has been true in the past.

"The moral test of government is how it treats those in the dawn of life, the children, those in the twilight of life, the elderly, and those in the shadow of life, the ill and the handicapped."

— Hubert H. Humphrey

I think the biomedical ethics center should have an educational goal of working with practitioners within the health fields—with the medical society. We've got to try and offer programs for those who come back to the university for continuing education. If they come back to get an

update on cardiology, they can come back to get updated on the latest word on withdrawal treatment or what our understanding is of consent procedures. I think those types of programs should move to the forefront of education.

Lastly, in the area of education, the center should try to help those in the humanities, particularly in the philosophy department, who really are seriously interested in acquiring expertise, to be able to take ethics courses at a graduate level.

In addition to those educational efforts, the vision I have is for the center to move into the areas that pay attention to the need to think fundamentally about what medicine is about—the need to move in the direction of policy by working with other professionals. When you've got a rich set of professional schools on campus—the law school, the Humphrey Institute—all kinds of opportunities are there to move through these expanding areas and take advantage of those resources in terms of educational programs for the university community.

Research

The second major area is research. I feel the best way for the center to operate is to pinpoint those areas where there is a need to do some work, and to bring together groups of people from the university and even from other campuses and from the community, as needed, to do that work.

For example, if someone wants to know how we are going to cope with AIDS and its costs and the testing issues that surround it, then I think the center should take a look at the question, and bring together the resources of the university to get involved in doing that work.

Medical Students Plan Ethics Conference

The Student Committee on Biomedical Ethics will hold a conference on February 27-28 to be called "Ethics and Economics in Health Care."

In their Statement of Purpose, the committee notes: "The underlying assumption of this conference is that considerations of justice must contribute to the design and reform of health-care institutions and the policies governing their practice. Hence this conference will 1) inform its participants of the status of medicine as an institution that serves or fails to meet the exigencies of medical care, and 2) sensitize its participants to issues of justice associated with health care's institutions."

The Friday evening session, called Focus on Access, will address "The Disenfranchised and the Excluded: a description of the exigencies of medical care for those who do not fit in the current medical models." Keynote speaker will

be David Hilfiker, M.D., noted author and physician for the Community of Hope Clinic, speaking on "Concerns of the Homeless and Indigent." Respondents will include Grey Panther representative Professor Grace Warfield.

The Saturday morning session, Focus on Allocation, will discuss: a) Criteria for analyzing and criticizing the institutions within medicine, and b) The mainline institutions within health care. Opening speaker will be Arthur Caplan, new director of the Center for Biomedical Ethics, addressing the subject of theoretical frameworks for understanding the common good and its just distribution.

Lunch will be followed by two 45-minute workshops on a wide variety of topics. The workshops will be followed by a one-hour panel discussion entitled: "Effecting Justice For All."

"The biggest issue is how best to integrate the need to provide optimal health care in an era of increasing awareness of the scarcity of resources, and adhere to our inviolable relationship of the individual patient and the health care provider."

—David M. Brown, M.D.

My vision is that the center should be an umbrella for the research that takes place. It should be a motivator and a center for research, so when people say, "I think this is an important issue . . . Why don't we do anything on the new reproductive technologies and what the legal ramifications are?" the answer is, "Well, let's get the center to do something. Let's pull together people who have the interest and expertise and see if we can write a working paper, or a white paper, or maybe produce a book or write a policy statement, or maybe we can hold a seminar for the press."

That's another kind of outreach—a press briefing. We can say, "Here's what we think the issues are, and here's what we'd like you to do in the way of reporting, because we think this is more accurate than what's appeared so far."

Community

The third goal relates to the community. The center's got to be in a position to take advantage of all the people in the state who are interested in medical ethics and health policy.


There's no doubt about Minnesota being one of the leaders in the health care field—it's

viewed as a pioneer by people all around the country. There are lots of community groups that like to hold forums and debate about policy questions, and I think the center should be cooperative about facilitating these groups and do what we can to encourage discussion.

I think you can give advice on those fronts and I think you can be helpful by enriching the dialogue that's going on already.

Policy

The last goal I see for the center—the most ambitious one—is to become involved in the policy area itself. I think that at the local, state, and national level, people are turning to those involved in biomedical ethics for advice, recommendation, and consultation. I don't think they really want answers. What I think they'd like is a better set of assumptions—a better set of presumptions—in terms of understanding what the arguments are that they are facing now, but even more, that they might be facing down the road.

I really see the biomedical ethics center as a kind of early warning system of medical ethics. A lot of other centers are focused only on the first goal, the teaching goal, and don't really take research, community work, or policy along with it. If Minnesota's going to be a pioneer in biotechnology, a pioneer in medical technology, and in health care delivery, it ought to be a leader in trying to figure out where the issues are coming from in terms of health care. 

University of Minnesota Center for Biomedical Ethics

Seed Money Awardees 1986-1987

Name/Department

Mila Aroskar
School of Public Health
Muriel J. Bebeau
Department of Health Ecology
School of Dentistry

George Hoshino, D.S.W.
School of Social Work
Rosalie Kane, D.S.W.
School of Social Work

Carl Kjellstrand, M.D.
Regional Kidney Disease Program
Department of Medicine
Hennepin County Medical Center

Project Title

Epidemiology of Ethical Problems in
Community Public Health Nursing
Undergraduate Preparation in Philosophy,
Humanities, and Social Sciences as
Predictors of Change in the Ability to Identify and Reason
About Ethical Issues in Dentistry
Discretionary Justice in the Allocation
and Delivery of Expensive New Medical Technology
Formulating Ethical Issues in Long-Term
Care: Resolving Complexities When Care Becomes Intertwined
With Everyday Life
Measurement of Distributive Justice in
Medicine; Analysis of Withdrawal of Life Support

Pre- and Post-Doctoral Fellows 1986-1987

Marilyn Bennett
Reidar Lie, M.D.
Margaret Roden, M.D.
Department of Sociology
Michael Swenson

Mary Ellen Waithe
Department of Health Ecology
School of Dentistry

The Goals of Rehabilitation and Respect for Persons
The Ethics of Controlled Clinical Trial and the Role of Clinical
Trials in the Justification of Clinical Intervention
The Bureaucratization of Death
The Office Physician in a Rawlsian Perspective: What
Constraints Are Placed by Principles of Justice?
Informed Consent and Paternalism With
Geriatrics Dentistry Patients

The Basic Medical Sciences:

Their Critical Importance At The University of Minnesota

By David M. Brown, M.D.
Basic Sciences Planning Committee

The basic medical sciences constitute the foundation upon which all biomedical research depends. It is the work conducted in the quest of answers to fundamental questions in cellular, molecular, and regulatory biology—aimed at improving our understanding of both normal and abnormal conditions—which applied scientists use to test their questions about disease states. Our own basic sciences departments have created a strong tradition of contributions to the knowledge base applied to medicine and to industry in Minnesota.

Traditionally, research programs in the basic sciences in medical schools have been divided into disciplines with specific scholarly outlooks: anatomy and pathology are structural disciplines, physiology is a functional discipline, and biochemistry, microbiology, and pharmacology are chemical disciplines. Even in the past, however, these divisions were not strict, since often the scientific questions asked in one discipline required knowledge or techniques from one or more other disciplines. At present these divisions clearly no longer hold, for the *research* activities in each of the departments have become less and less distinct from one another; at the same time, many interdisciplinary programs have developed (neurosciences, molecular biology, biophysics, cell biology), and these have fostered hitherto unforeseen alliances among traditional departments.

The apparent blurring of disciplinary lines should not be misconstrued as the demise of traditional departments. Rather, the effect has been that all of the disciplines have adopted common research tools to answer the scientific questions unique to each discipline.

An illustration of the diversity of approaches in basic sciences to address fundamental biological problems can be found in work on the acetylcholine receptor, an absolutely essential component of transmission of nerve signals from one cell to another in some organs. The *cell biologist* is interested in where the receptor is in the three-dimensional architecture of the cell and how it interacts with other cellular structures in regulating cellular function. The *biochemist* is interested in how it is assembled from its constituent parts and (along with the cell biologist and pathologist) how its expression is controlled at the gene level. The *physiologist* is interested in how it works in the integrated functions of organs and body systems. The *pharmacologist* is interested in how receptor function can be modified or controlled with drugs, and the *pathologist* is interested in what happens to receptor function during disease states and how this can be reversed. Although acetylcholine receptors are found in cells of higher animals, the *microbiologist* may insert the gene(s) encoding the receptor into bacteria or bacteriophages and study many aspects of regulation of gene expression.

Even though the scientific questions being asked may be quite diverse, research from these different perspectives will utilize many common research tools; for instance, biochemical techniques of protein purification, recombinant DNA technology, techniques for analysis of receptors, light, and electron microscopy. As a natural consequence, individuals possessing expertise with these research tools may be found in each of the departments.

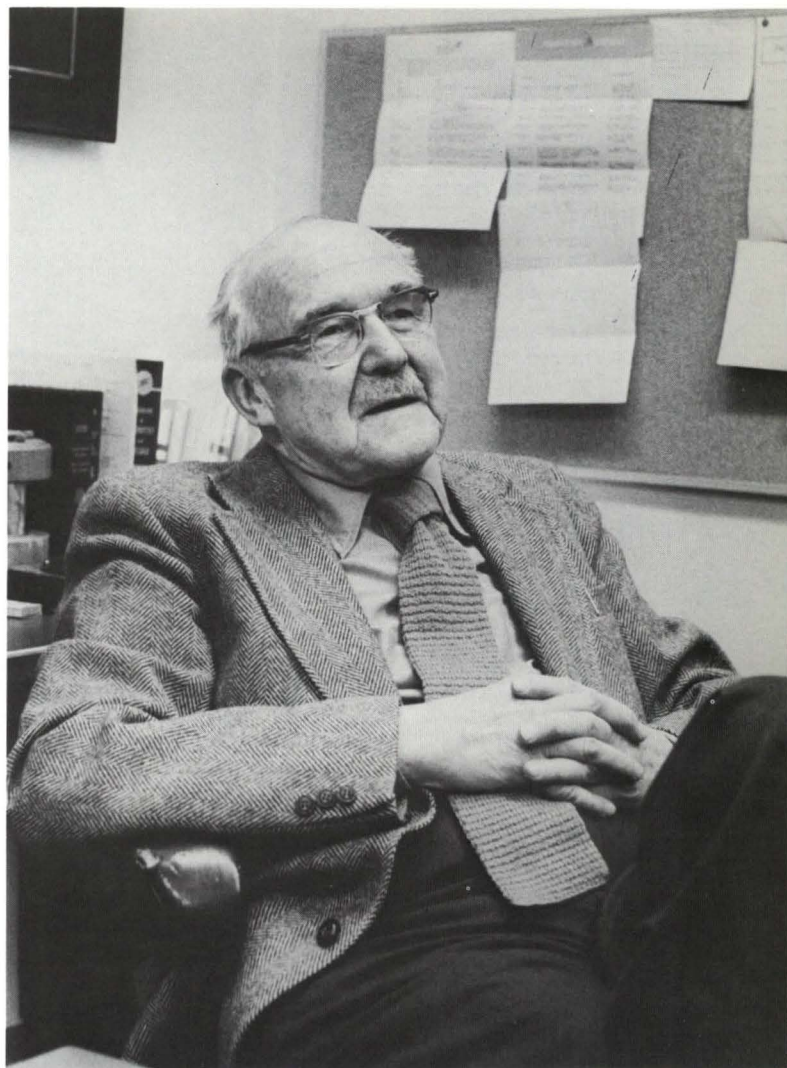
Research in the basic medical sciences addresses both fundamental questions of general importance in biology and questions that can have significant impact on clinical medicine and thus on the health of the citizens of the state of Minnesota. Many examples of the contributions to improvement in the treatment of disease from the ranks of the University of Minnesota basic medical sciences faculty could be cited. Here are a few examples:

- Hal Downey, whose fundamental studies on morphology of blood cells led to diagnostic tools in hematology that are used worldwide.
- Allen Boyden, whose careful studies on the segmentation of the lung stimulated internationally the clinical development of thoracic surgery.
- Arnold Lazarow, whose pioneering work on the islets of Langerhans led directly to equally pioneering clinical work on transplantation of pancreas and islets in treatment of diabetes.
- Maurice Visscher, whose collaboration with clinical scientists on cardiovascular physiology led to development of heart-lung machines and, ultimately, to successful surgery on congenital and acquired heart defects.
- Wallace Armstrong, whose outstanding work on fluoride metabolism was of great importance in clinical control of dental caries and dental public health.
- Robert Good, a modern giant in the field of immunology, whose fundamental work in that field has been of great importance in clinical aspects of cancer and transplantation.

The list could be much longer, but the examples given make the point of the importance of basic research to clinical medicine and public health. Today similar efforts at the University of Minnesota are bringing equally impressive gains to medicine (*e.g.*, Tony Faras in development of recombinant DNA approaches to diagnosis of genetic diseases; Leo Furcht, Tucker LeBien and others in development of immunological/antibody approaches to diagnosis and treatment of disease; Fritz Bach and his clinical colleagues in the role of immunology in transplantation; Richard Purple in making fundamental discoveries on the bases of retinal diseases; Steven McLoon in development of transplantation of nervous tissue; Robert Elde, Akira Takemori and many others on understanding the biological bases of pain; and numerous others). It is safe to assert that this crucial role of basic investigation in the advancement of clinical medicine will continue in the future.

The basic medical sciences departments will continue to play a crucial role in providing health and vitality to our state.

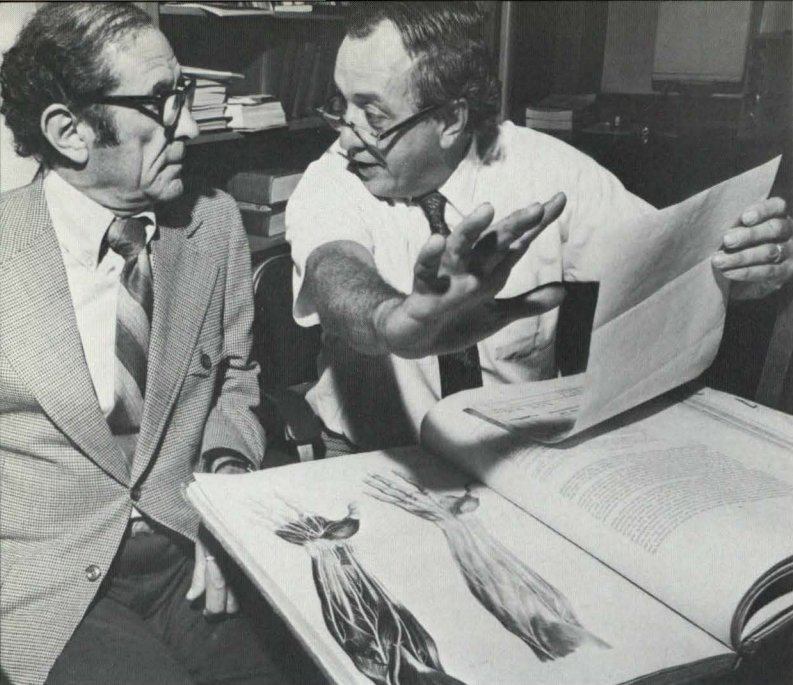
Today, research in the basic medical sciences departments spans the spectrum of biology, from human systems biology to regulation of metabolic enzymes in yeast, and the faculty has been successful in obtaining large amounts



Dr. Maurice Visscher

of federal and non-federal funds to support its activities. The basic medical sciences faculty, which comprises less than 25 percent of the medical school faculty, obtained more than 25 percent of the total National Institutes of Health (NIH) and Alcohol, Drug Abuse and Mental Health Administration (ADAMHA) grant funds awarded to investigators in the medical school and 16 percent of the total NIH and ADAMHA funds in the university in 1985. Even more impressive is the fact that faculty members in these departments were awarded an average of approximately 2 percent of the total number of grants awarded nationally in these disciplines by NIH.

The basic medical sciences departments bring to the university approximately \$10 million per year in grant funds plus an estimated \$7 million in grant support to the clinical departments, which are dependent upon the strengths of basic scientists for their research programs. This interdependency of clinical research and the basic sciences will continue to increase as the tools for biomedical research continue to rely upon basic processes.



Dr. Robert Good, right

Furthermore, as evidenced by the continued growth and strength of Minnesota industries, many of which had beginnings rooted in the medical school, the basic medical sciences departments will continue to play a crucial role in providing health and vitality to our state. Collaboration with the basic medical sciences departments at the university was essential in the creation and strengthening of Medtronic, Molecular Genetics, Endotronics, Genesis, Immunonuclear, and other companies identified in the biomedical industrial complex so important to Minnesota.

The basic medical sciences are the foundation upon which the priorities of the medical school are built. New directions will be undertaken in the next decade in the areas of genetics, ethics, neurosciences, biomedical engineering/biophysics, nutrition, and cardiovascular/pulmonary medicine. All of these new thrusts depend upon strong, modern basic medical sciences departments with scientists working at the cutting edges of their disciplines.

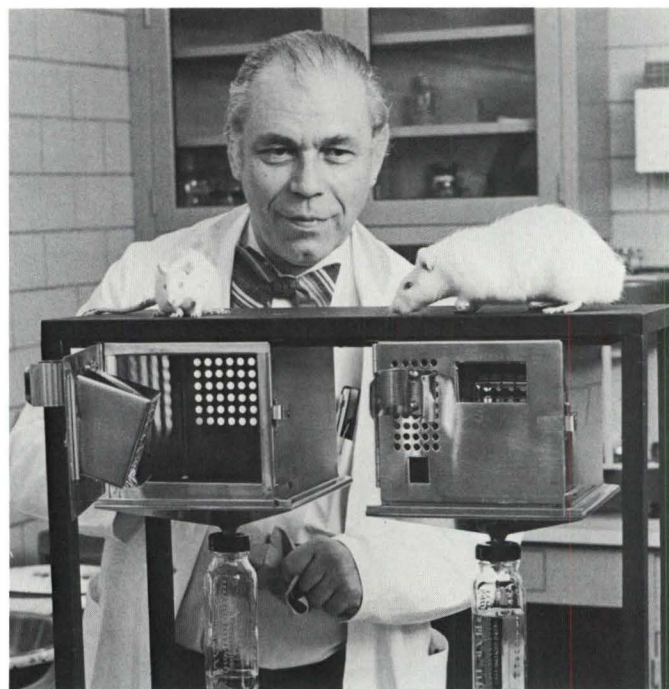
The basic medical sciences are the foundation upon which the priorities of the medical school are built.

During the 1985-86 academic year the basic medical sciences departments began an analysis to plan for changes in research emphasis in the departments during the next decade. Most departments anticipate strengthening the areas of cell biology, developmental biology, molecular biology, and/or immunobiology. Neurosciences will be strengthened in five of the six departments; biophysics and bioengineering will be a focus in biochemistry and physiology; and specialized areas of toxicology and biotechnology will be expanded in pharmacology, microbiology, and physiology.

The present physical facilities housing the basic medical sciences in the Jackson-Owre-Millard-Lyon complex were built prior to 1952, and 90 percent of the complex was built between 1910 and 1931. Those buildings were built for a type of science no longer practiced; they are totally inadequate for contemporary research. A recent survey of the facilities can be summarized as follows:

- Air conditioning and ventilation are inadequate and, in some instances, significantly interfere with the proper conduct of research.
- Frequent flooding seriously retards research progress and productivity.
- Inadequate electrical wiring in many laboratories results in the inability to run instruments.
- Inadequate chemical and biological ventilation and protection hoods to remove toxic substances and to allow appropriate work with tissue cultures, viruses, and other biological substances markedly hinder or even prevent research activities.
- The general state of the buildings does not allow flexibility in program changes in research without long and expensive delays.

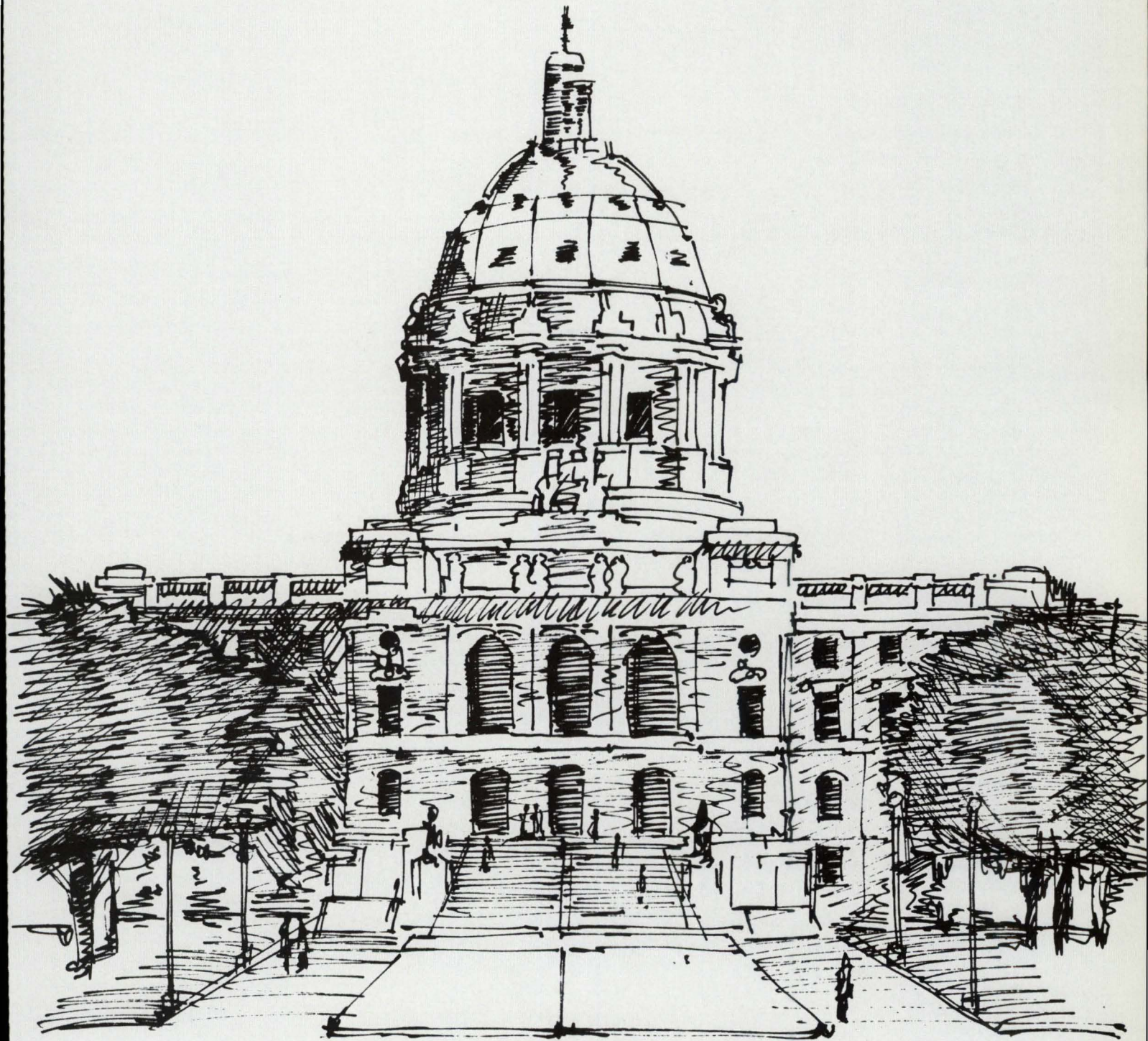
An extensive analysis of the options available for providing appropriate facilities for the basic medical sciences led to the conclusion that the costs for reconstruction of major structures while attempting to furnish space and services makes the use of the present facilities infeasible. Furthermore, to delay longer in the replacement of the outdated buildings would have a negative impact on the research which can and must be done at the University of Minnesota. The dedication of this state's economic strength in medically related industry necessitates the university's investment in biomedical research and graduate education. The "incubator" which gives birth to research strength is badly in need of replacement. It requires our immediate attention. ☂



Dr. Arnold Lazarow

David M. Brown, M.D., is dean of the University of Minnesota Medical School.

A Legislative Report: Health Sciences



Each year the Health Sciences prepare a request which is included in the University of Minnesota's total financial request to the Legislature for the biennium. The following Health Sciences capital projects will be presented in the 1987 session.

Health Sciences

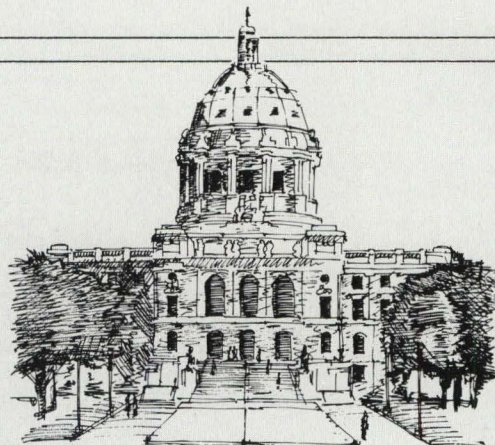
Planning For Basic Biomedical Sciences/ Biomedical Engineering Center

Project Description

Funds are requested to renovate 45,307 Assignable Square Feet (ASF) of office and support space in the existing Jackson/Owre/Millard/Lyon (JOML) complex for Medical School basic sciences departments. To the greatest extent possible, Phase I improvements made to JOML in 1977 will be maintained and further upgraded. In order to accommodate the projected basic sciences program space requirements, it is proposed that a new building of 205,971 ASF and 368,105 Gross Square Feet (GSF) be constructed on the current site of the Botany and Zoology buildings. In addition to providing research laboratories for the basic sciences departments, the new facility also includes space for the newly established Biomedical Engineering Center.

Project Impact

The basic health sciences departments teach professional and allied health students in the Schools of Medicine, Dentistry, Pharmacy, Nursing, and Public Health, and, in addition, provide instruction to students in more than eight schools and colleges throughout the university. The faculty in the basic health sciences generates more than \$8 million per year in federal research dollars and an additional \$1 to \$2 million per year in grants from non-federal sources. The departments (biochemistry, cell biology and neuroanatomy, laboratory medicine and pathology, microbiology, pharmacology, and physiology) are an important part of university-wide efforts in research and education in basic biology and fit well within the goals of the university's Commitment to Focus.



Five of the departments are housed in the JOML complex (which consists of 366,000 GSF), a large part of which was built in the early 1900s. Because of their age and mechanical and structural defects, the buildings will require extensive work to bring them into compliance with code regulations and to provide up-to-date laboratory space for the academic programs.

When Moos Tower was completed and the School of Dentistry moved to its new quarters, a portion of JOML, approximately 137,000 GSF, was remodeled under Phase I in 1977-78. The plan called for remodeling of remaining space under Phase II. Ten years have elapsed and it has become evident that the basic sciences programs can no longer continue to function in facilities which are totally inadequate for current teaching and research. Continued success in competing for research dollars and outstanding students will be seriously compromised if research laboratories are not upgraded to an acceptable level.

In view of the age and present condition of JOML, it is obvious that in order to provide suitable research laboratories and support space, and meet all code and safety requirements, the cost of remodeling the entire complex would be substantial. It was felt that construction of a new facility should be explored as a possible alternative. A committee appointed by the vice president for finance reviewed basic sciences' program needs for the next decade, prepared

alternative approaches, and estimated costs to accommodate the facilities needs.

The committee reviewed and endorsed the proposed program plan which includes a modest increase in faculty and space. With the assistance of a consultant, the academic plan has been translated into required space.

The proposed basic biomedical sciences building also includes 45,000 ASF necessary to house the recently established Biomedical Engineering Center.

The establishment of a Biomedical Engineering Center at the University of Minnesota will build on the strengths of the Medical School, the Institute of Technology, and the over 300 firms in the state of Minnesota who are involved in industrial activity encompassing a broad range of biomedical engineering in technologies. The Biomedical Engineering Center, dedicated to excellence in biomedical engineering education and research, will provide: 1) a facility capable of supporting, promoting, and expanding the existing interdisciplinary biomedical research and educational activities at the university; 2) a focal point for industry-university cooperation in accelerating the process of taking new technology from the laboratory to the commercial setting for the benefit of patients; 3) a focus for collaboration among faculty in basic health sciences departments and departments of the Institute of Technology for advanced basic research in biomedical engineering and a site capable of facilitating involvement of industrial personnel in university educational programs on a wide range of levels; 4) easier access by both university and industrial personnel to specialized testing services and laboratory facilities, particularly for the clinical testing of potentially useful products in a critical academic environment; and 5) an incubator for concepts, expertise, and new technology which lead to the development of new products, new companies, and additional employment opportunities. The Biomedical Engineering Center will provide facilities for a biophysics laboratory, scientific apparatus laboratory as well as other laboratories and support services.

Duluth Campus

UMD Medical School Addition

Project Description

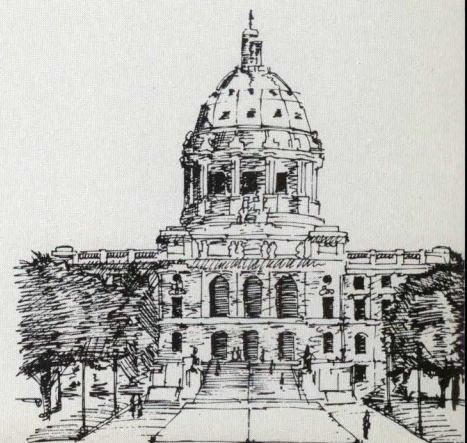
Funds are requested to construct an addition to the UMD Medical School building. Since completion of the building in 1979, the School of Medicine has grown, especially in the area of research. In order to adequately satisfy unmet space needs and accommodate projected growth in research funding, it is estimated that an additional 10,000 ASF and 16,000 GSF is needed to house research laboratories and related support functions.

Project Impact

Since its inception, the Duluth School of Medicine has established a successful track record in recruiting and preparing medical students for careers in the field of primary health care delivery. In addition, the faculty has been highly successful in competing and attracting federal research funds. The amount of both federal and private funding has doubled in the past five years and at the present time, totals nearly \$2 million.

In order to accommodate academic programs and research projects, it has been necessary to continue to use the lower campus facilities, in spite of their deficiencies, on a limited basis. In addition to the deteriorating condition of these facilities, the splitting of a relatively small group of basic sciences faculty is also counterproductive to collaborative research efforts.

Continued success in competing for new research funds depends on availability of adequate space in which to house additional research projects and associated post doctoral and graduate students.



Health Sciences

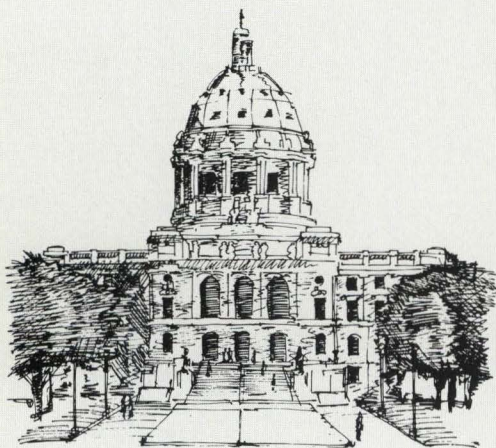
Renovation of Vacated Hospital Space

Project Description

Following the completion of Unit J, the hospital has and will be vacating 97,460 GSF and 53,600 ASF in Mayo and Variety Club Heart Hospital. The space was built to serve patient needs and related hospital functions and needs to be remodeled to be usable for other purposes. Most of the vacated space will be assigned to the Medical School in order to alleviate a severe shortage of space for existing and newly emerging programs.

Project Impact

The major emphasis for this space will be centered on cardiovascular diseases and the neurosciences. Many of the greatest opportunities to study and apply new knowledge to the diagnoses and treatment of common human neurologic diseases are in the basic biological sciences. Secondly, heart and vascular research have been major strengths of the Medical School for several decades. The renovation of the space will contribute to further strengthening established and successful cardiovascular and neuro research and education programs. Further, renovation of this space will alleviate overcrowding for some programs such as orthopaedic surgery and will reduce the need for off-campus leased space. In summary, completion of this project will provide an essential building block for further growth and development in both basic and clinical sciences, especially in the programmatic areas of cardiovascular and neuroscience disease.



Health Sciences

Electrical/Mechanical Upgrade For Health Sciences—Utilities and Services

Project Description

Funds are requested for the upgrading and expansion of the two primary health sciences air conditioning plants and for upgrading the electrical systems within the complex. The work proposed includes: 1) the addition of a second 1,200 ton chiller in the Dwan Research Center Plant with associated cooling towers, pumps, and related auxiliaries; 2) the installation of three additional 1,250 ton chillers, cooling towers, pumps and auxiliaries in the Moos Tower Plant; 3) the installation of primary chilled water mains in Jackson and Diehl Halls; and 4) the replacement of electrical system elements which are obsolete or are approaching obsolescence and undertaking related electrical systems upgrade.

Project Impact

An urgent need exists to upgrade and expand the primary air conditioning plants in order to permit the continued addition of remodeled areas to the primary plants and to facilitate phasing out small aging air conditioning units. It is becoming difficult to accommodate remodeled areas with the existing obsolete electrical system elements. The impact of this project not being authorized would include: 1) the long term reliability of these primary plants will be reduced; 2) programmable space in remodeled areas will have to be sacrificed to provide space for small air conditioning units; 3) remodeling projects will have to bear the additional installed cost of smaller units; 4) high maintenance and operating costs associated with small unit installations will continue; and 5) the larger electrical requirements of small air conditioning units will increase remodeling costs and will aggravate electrical conditions in the complex.

MEDICAL SCHOOL NEWSBRIEFS

Dr. Jack Oppenheimer Named To Cecil J. Watson Chair In Medicine

The University of Minnesota Medical School has announced the appointment of Dr. Jack H. Oppenheimer to the Cecil J. Watson Chair in Medicine.

Dr. Oppenheimer is a member of the department of medicine and physiology and director of the section of endocrinology and metabolism. His research has focused on the peripheral metabolism and action of the thyroid hormone. In 1972 he and his colleagues discovered the nuclear receptor for the thyroid hormone, the site at which the hormone regulates cellular processes.

Dr. Oppenheimer has been honored with the Van Meter and the Parke-Davis Awards of the American Thyroid Association and has served as the president of this organization. He is also the recipient of the Henry Moses Award of the Montefiore Hospital Alumni Association and the Edwin B.

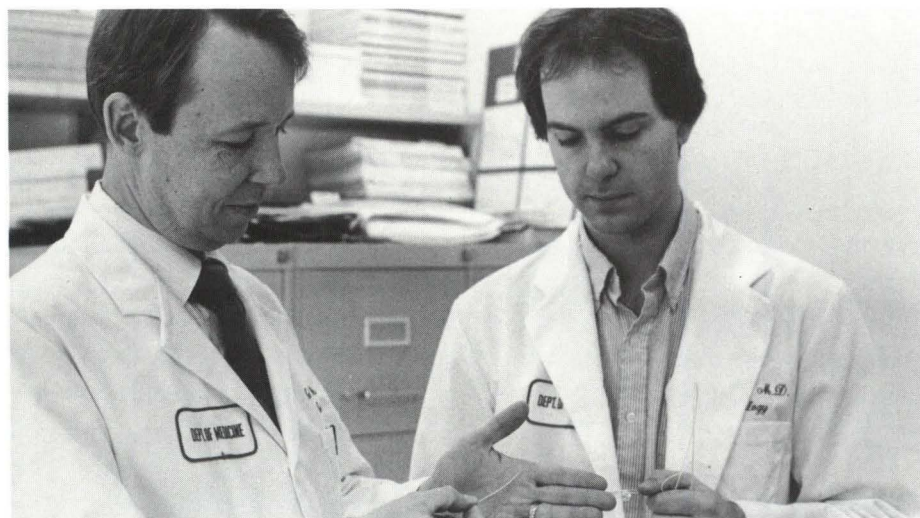
Astwood Award of the Endocrine Society. He has served on the editorial boards of many scientific journals including *Endocrinology*, the *Journal of Clinical Endocrinology and Metabolism*, the *Journal of Clinical Investigation*, and the *Journal of Biological Chemistry*.

A graduate of Princeton University and the College of Physicians and Surgeons of Columbia University, Dr. Oppenheimer was professor of medicine and head of endocrinology at the Montefiore Hospital and Medical Centers prior to coming to the University of Minnesota in 1976.

Dr. Cecil J. Watson (1902-1983) was head of the department of medicine at the University of Minnesota Medical School from 1943 to 1966. Prior to his retirement, he was named a regents' professor of the university. Dr. Watson was known for his pioneering work on hematin as a treatment for porphyria and has been recognized in academic medicine throughout the country for his contributions to medicine and science. □



Dr. Thomas J. Ferris, chairman, department of medicine, and Dr. Jack H. Oppenheimer.



Drs. White and Wilson with catheter and probe used to determine artery obstruction.

Ultrasound Probe Major Step Forward In Determining Coronary Disease

Ultrasound technology is being used by University of Minnesota researchers to gain a more accurate assessment of

coronary damage than has been available through use of coronary arteriography, a technique that involves dyes and X-rays.

The method, which could aid doctors in deciding which patients will benefit from heart bypass surgery, uses a type of ultrasound crystal that can

be placed directly on or in an artery and—through ultrasound emissions—gives a much better picture of an artery's actual obstruction.

Researchers Dr. Carl White and Dr. Robert Wilson developed a device called a Doppler velocity probe while they were at the University of Iowa, in conjunction with that university's bioengineers. They are currently the only researchers in the world who have approval to use the probe. The probe has also been found to be useful for patients who have vessels that are anatomically correct but may be physiologically unsound.

Dr. White, co-director of the university's Heart and Lung Institute, clinical cardiology services director and heart catheterization director, and Dr. Wilson, co-director of heart catheterization, have approval for clinical trials of the probe to be done at the University of Minnesota Hospital and Clinics. The multi-center test will include about 400 patients. Medtronic Inc. will manufacture the probe when the study is completed.

Continued on Next Page

Coronary bypass operations were performed on 170,000 people in the United States in 1982 to treat cardiovascular disease, the leading cause of death in this country. In most of these cases, the decision to operate was based on the results of coronary arteriography, which involves injection of a radiopaque dye to obtain X-rays of coronary arteries so the extent of blockage can be determined.

The method has a number of shortcomings, including a lack of consistency in interpretation. Both overestimation and underestimation of the severity of coronary obstructions occur.

During their initial studies more than three years ago, Drs. White and Wilson used a probe applied by suction to a coronary artery during open-heart surgery. Surgeons obstructed the vessel for approximately 20 seconds and then released it. The overshoot in blood flow, measured by the probe, that occurs after the transient obstruction provides an excellent measure of the real level of coronary obstruction.

"Although the use of the probe in the operating room was a big step above what had been done previously, we wanted to be able to use it to complement arteriography before we even scheduled surgery," Dr. White says. "So we developed a catheter that would hold the probe and could be used in patients with a minimum amount of risk."

The catheter is approximately two feet long and about as thin as a stereo speaker wire. The probe, roughly the size of a diamond chip, is contained in the catheter's end. When the probe is used before any surgery, a special fast-acting drug that increases blood flow to its maximum rate is used so physicians can see any possible obstruction under the best circumstances.

"This probe has been used over two years' time in approximately 200 patients, and we have found it to be an excellent way to deal with the problem of arteriography, which really just produces a picture that is subject to very broad interpretation," Dr. White says. "In many cases we have found that patients have not needed either bypass surgery or balloon angioplasty (a method that dilates blood vessels)."

The probe also helps doctors come to grips with the problem of underestimating the amount of obstruction. "With arteriography alone, there was a tremendous gray area regarding determination of occlusion," Dr. White says. "Working with the probe in addi-

tion to arteriography, we can tell if the patient needs more in the way of bypass reconstruction or vessel dilation, and we can do it. We can also use the probe later to see if bypass grafts are working as they should or if we have dilated the vessels sufficiently."

Region's First Biomedical Engineering Center Announced

University of Minnesota President Kenneth H. Keller has announced plans for the region's first biomedical engineering center, one of only five in the nation.

The center will unite the university's medical and engineering faculties with the state's more than 300 medical products companies. The 33,000-square-foot center is to be located on the Minneapolis East Bank campus.

A \$2 million cornerstone gift for the center will be donated by the Medtronic Foundation. The university will provide another \$2 million in matched funds and has committed to raise an additional \$2 million from private sources. The Medtronic Foundation gift is part of the university's \$300 million fundraising effort, The Minnesota Campaign.

One million dollars of The Medtronic Foundation donation is for the center's directorship, which will be called the Earl E. Bakken Chair. Bakken, a university of Minnesota graduate and founder of the Fridley-based Medtronic Corporation, developed the first wearable, external, battery-powered pacemaker. Medtronic Inc., the world's leading manufacturer of implantable medical devices, reported sales of more than \$400 million in 1985.

Collaborative Research Effort Receives \$1.4 Million Grant

The cytomegalovirus (CMV) research program at Children's Hospital of St. Paul has been awarded a \$1.4 million grant from the National Institutes of Health (NIH). CMV is the leading infectious cause of mental and physical handicaps in newborn infants. CMV infection poses the greatest risk to developing fetuses, in some cases causing mental retardation, deafness, or physical disabilities.

The research represents a major collaborative effort between Children's

Initial research results from the probe's use have been presented at American Heart Association meetings in 1984 and 1985 and were published in the March 29, 1984, issue of the *New England Journal of Medicine* and other cardiology journals. □



Earl E. Bakken, foreground, and Kenneth H. Keller with cardiac pacemaker.

"We are committed to creating an internationally recognized biomedical engineering center that will serve as a magnet for existing and future biomedical engineering technologies," says President Keller. A nationwide search will be conducted for the director.

The study of cardiovascular disease will be a major focus of the center. A joint university-industry council will determine other areas of emphasis, which may include research and development of such devices as implantable hearing prosthesis, nerve stimulators, and audio/visual stimulators. □

Hospital and research laboratories at the University of Minnesota and University of Iowa. Director of Children's research program is Richard Gehrz, M.D., director of immunology/virology research at Children's. Directors of the participating research laboratories at the University of Minnesota are Fritz Bach, M.D., and Colin Jordan, M.D. Director of the research laboratory at the University of Iowa is Mark Stinski, Ph.D.

Research at Children's Hospital focuses on the body's immune system and how it responds to CMV. Researchers hope to develop a vaccine to prevent CMV infection. □

Hypertension Among Chippewas High According To UMD Study

Hypertension and related heart disease among American Indians in Northeastern Minnesota is greater than for most other Indians as well as for the nation in general, according to a University of Minnesota, Duluth (UMD) study. The study also shows that Indian men are more prone to having hypertension than Indian women.

The four-year study of hypertension in Indian communities within Northeastern Minnesota was conducted by Joyce Kramer, associate professor of social work in the UMD College of Education and Human Service Professions. Support for the project came from the Minority Biomedical Research Support (MBRS) program of the National Institutes of Health.

Kramer traveled to 11 Indian reservations in Northeastern Minnesota and, with the help of approximately a dozen students, polled people visiting the Arrowhead Traveling Health Screening Clinic at those sites. Over a three-year period they screened 937 American Indians, mostly Chippewa, and 357 non-Indians.

In the test group, 24 percent of the Indian men in the 20 to 39 age range had hypertension (high blood pressure) compared with 14 percent of the non-Indian men. In the 40 to 59 age group, 26 percent of the Indian men suffered from hypertension compared to 22 percent for the non-Indian men.

Kramer also cites statistics from the U.S. Department of Health and Human Services National Center for Health Statistics which show that while cardiovascular deaths for all races in the U.S. have been steadily declining since 1967, deaths from heart attacks have been increasing for the Indian population.

Kramer attributes the increase in hypertension to changes in diet and exercise. She says the diet of the Chippewas has changed from the traditional Indian staples of wild rice, berries, fruits, and wild game and fish to foods containing "empty calories"—foods that are high in salt and sugar and low in nutrition. In addition, Indians are consuming more fatty cuts of meat, more fried foods, more refined foods, as well as large quantities of salt. Indians also lead relatively sedentary and

urbanized lifestyles as compared to their ancestors.

However, Kramer says, one of the major causes of hypertension and cardiovascular ailments among the Chippewa is cigarette smoking. "Indians smoke more than any other ethnic group in this country including whites, blacks, Asians, and Hispanics," Kramer states.

"Our report advises Indians to use tobacco for ceremonial purposes only," Kramer says. "If Indians went back to their roots, and the lifestyles of their ancestors, they would lead much healthier lives." □



C. Edward Schwartz

Schwartz Named Chairman-Elect Of Minnesota Hospital Association

C. Edward Schwartz, hospital director of the University of Minnesota Hospital and Clinic, was voted chairman-elect of the Minnesota Hospital Association (MHA) at its annual meeting in September.

Schwartz will serve as an officer on MHA's board of trustees for three years beginning in January 1987, and will become chairman in 1988. He has been hospital director and assistant vice president for health sciences at the university since 1983.

Before coming to Minnesota, Schwartz was chief operating officer at University of Michigan Hospitals in Ann Arbor, and chief executive officer at Muhlenberg Community Hospital in Greenville, Kentucky. □

Dr. Vanselow Receives Appointments

The Department of Health and Human Services has announced the appointment of 14 members, including 10 physicians, to the newly created Council on Graduate Medical Education. Dr. Neal A. Vanselow, vice president for health sciences, University of Minnesota, was appointed as a member of the new council.

The 17-member council, which includes three federal officials, will assess physician manpower needs on a continuing basis and recommend appropriate private and federal sector efforts for addressing those needs. It also will provide a forum for consideration of changing medical personnel needs.

The council will advise the HHS secretary and congressional committees on federal policies regarding the supply and distribution of physicians in the United States, current and future physician specialty shortages and surpluses, and issues relating to foreign medical graduates.

The council is also charged with advising and making recommendations on appropriate efforts to be carried out by hospitals, medical schools, and accrediting bodies, and it is to encourage entities providing graduate medical education conduct activities to voluntarily achieve the recommendations of the council.

Dr. Vanselow was also elected chairman-elect of the Association of American Medical Colleges during the association's annual meeting in October. □



Dr. Neal A. Vanselow

Eddie Rabbit Sings For Potter's House

Eddie Rabbit and The Hare Trigger Band gave a well-attended and much-appreciated concert this fall in support of Potter's House. The program also included welcoming remarks by Charlie Boone and Roger Erickson of WCCO-Radio, Dr. John Najarian and Mignette Najarian, and Michael Lawson, house manager of Potter's House.

Potter's House is a home-away-from-home for families of patients undergoing transplant surgery at University Hospital. It came into being to give help and hope to transplant families, many of whom come long dis-

tances and stay many weeks.

The house holds 13 families. Each has a private bedroom, and they share common living rooms, laundry, kitchen, and dining room, plus indoor and outdoor play space for the children. Families share cleaning, cooking, and shopping. A full-time house manager lives on the premises, overseeing day-to-day operations and providing support for families.

Eddie Rabbit's son, Timothy, died following liver transplant surgery. Eddie and his band performed in memory of Timothy, and accepted no payment for their Carlton Celebrity Theater concert. All proceeds went to the support of Potter's House. □



Eddie Rabbit plays for the children at Potter's House.

New Toxic Shock Strain Identified In Surgical Patients

Hospital personnel can be chronic carriers of the organism that causes toxic shock syndrome, researchers warned in a recently published article.

The article in the journal *Annals of Internal Medicine* describes two cases of toxic shock syndrome (TSS) occurring four years apart in two different patients of a neurosurgeon. DNA analysis of TSS-causing *Staphylococcus aureus* organisms obtained from each patient and from the nostrils of the surgeon revealed that they are indistinguishable from each other, and may have been transmitted to the patients during surgery.

University of Minnesota microbiologist Patrick M. Schlievert, Ph.D., says that the strain of *S. aureus* reported in the article is unique in several of its effects. In the patients, it did not cause a purulent lesion at the surgical site, which is the usual warning sign of *S.*

aureus in surgical patients. This may delay diagnosis of TSS, and "before you know it the patient has a full blown case of toxic shock syndrome," he says.

Antibiotic treatment usually rids patients of TSS symptoms and any trace of *S. aureus*, but in the surgeon the organism has been controlled but not eradicated by continuous treatment with antibiotics. Although the surgeon has no symptoms of TSS, the organism can be transmitted to patients, apparently carried by air exhaled through the surgeon's nose. Since identifying this problem, extra precautions have been taken to prevent further cases of TSS. The authors state that 200 cases of TSS after surgery have been documented, but only in the two cases they describe has the source and route of transmission been identified.

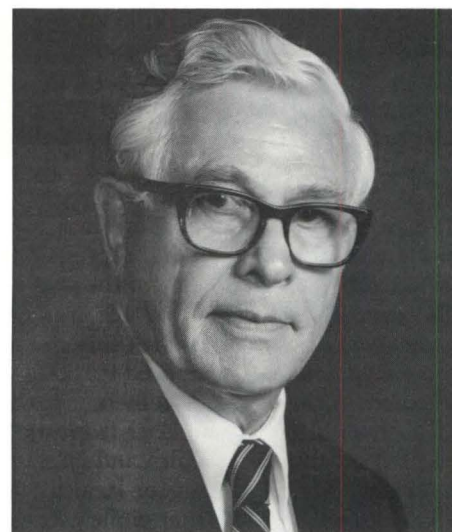
Schlievert says the university's department of microbiology is the only laboratory using the DNA method for determining the relatedness of *S. aureus* strains. His laboratory is working on a

Dr. Gullickson Receives Distinguished Clinician Award

Professor Emeritus Glenn Gullickson received the Distinguished Clinician Award from the American Academy of Physical Medicine and Rehabilitation in October. The Academy consists of 2,500 physiatrists, specialists in physical medicine and rehabilitation.

The award is given to recognize outstanding ability of distinguished clinicians. Dr. Gullickson is only the second Minnesotan to receive the award, which was given to only three of 2,500 physiatrists this year.

Dr. Gullickson retired in 1986 from the faculty of the University of Minnesota Medical School after a 40-year career with the university. At the time of his retirement, he was professor and clinical chief in the university's department of physical medicine and rehabilitation. Dr. Gullickson was president of the Academy in 1970-71 and was president of the American Congress of Rehabilitation Medicine in 1984-85. □



Dr. Glenn Gullickson

method of genetically altering the new strain of *S. aureus* so that it will no longer make TSS toxin. The altered strain could then be used to overwhelm the original strain in the surgeon. The same strategy could be used to treat other chronic carriers of *S. aureus*, if and when they are identified.

Authors of the article were Barry N. Kreiswirth, Ph.D., and Richard P. Novick, M.D., both of the Public Health Research Institute in New York City; Gary R. Kravitz, M.D., department of medicine, University of Minnesota; and Schlievert. □

Research Grants Given To Medical School Faculty

The University of Minnesota Medical School is among the national leaders in the number of principal investigators (the lead investigators on grants) and in the amount of

outside funded research expenditures per faculty member. Following are some of the recipients of new grants.

Department	Principal Investigator	Grant Agency Amount	Research Project
Biochemistry	James B. Howard	National Institute of General Medical Sciences \$130,872	Structure and Mechanism of FE:S Progeins
Cell Biology and Neuroanatomy	David W. Hamilton	National Institute of General Medical Sciences \$28,000	Marc Research Fellowship Award
	Paul C. Letourneau	Spinal Cord Society \$36,615	The Role of Adhesion in Axon Growth and Regeneration by Spinal Cord Neurons
	Virginia S. Seybold	National Science Foundation Division of Behavioral and Neural Sciences \$40,000	Transmitter Regulation of Neurosecretory Neurons
Laboratory Medicine and Pathology	Ralph Butkowski	Minnesota Heart Association \$21,636	Basement Membrane Antigens in Tubulointerstitial Nephritis
	Richard D. Estensen	Elsa Pardee Foundation \$40,000	Resistance to Tumor Promoters - Dominant or Recessive
	Scott M. Freeman	National Institute of Allergy and Infectious Diseases	The Relationship of the HLA-D Region to Disease
	Leo T. Furcht	National Eye Institute \$96,509	Corneal Healing Promotion with Fibronectin Peptides
	Harry T. Orr	National Institute of Neurological and Communicative Disorder and Stroke \$108,020	Molecular Genetics of Spinocerebellar Ataxia
	Stephen S. Rich	National Institute of Arthritis Disability and Diagnosis and Kidney Disease \$42,604	Heterogeneity in IDDM Families with Autoimmune Disease
	Amy Skubitz	American Cancer Society \$3,000	Laminin Peptide Inhibition of Tremor Metastasis
	Lee W. Wattenberg	National Cancer Institute \$375,350	Chemoprevention of Carcinogenesis by Nucleophiles
Medicine	Stephen Archer	American College of Chest Physicians \$18,000	AC-CP Research and Training Fellowship
	Donald Hunninghake	National Heart, Lung and Blood Institute \$969,981	A Physician Based Nutrition Program to Lower CHD Risk
	David Laxson	Minnesota Heart Association \$17,120	Myocardial Function and Coronary Dynamics Following Ischemia
	Allen Levine	National Institute on Drug Abuse \$79,256	Glucose Modulation of Opioid-Induced Feeling
	Ronald P. Messner	National Institute of Arthritis Disability and Diagnosis and Kidney Disease \$135,792	Autoantibodies in Technicians Handling Lupus Blood
	Anna E. Schroer	Arthritis Foundation, Minnesota Chapter \$17,000	The Lupus Inhibitor: Effects on Cultured Endothelial Cells
	Thekkumkatil Thomas	Lupus Foundation of America \$10,000	Role of Polyaxius in Lupus
	Dorothy L. Whitmer	National Institute of Arthritis Disability and Diagnosis and Kidney Disease \$87,972	Cyclic Nucleotide Metabolic Flux in Cell Secretion
	Anthony C. Woolley	National Kidney Foundation \$19,000	The Role of Prostaglandias in the Progression of Chronic Renal Failure
	Anthony C. Woolley	National Institute of Arthritis Disability and Diagnosis and Kidney Disease \$29,004	Prostaglandins in the Progression of Renal Failure
	Steven Zimmer	National Heart, Lung and Blood Institute \$29,004	Research Fellowship Award
	Steven Zimmer	Minnesota Heart Association \$24,000	High Energy Phosphate Metabolism in Normal and Ischemic Hearts

Department	Principal Investigator	Grant Agency Amount	Research Project
Microbiology	Paul P. Cleary	Minnesota Heart Association \$24,000	DNA Fingerprinting in Characterizing Pathogenic Streptococci
	Ronald Jemmerson	National Institute of Allergy and Infectious Diseases \$75,189	Antibody Responses to Synthetic Epitopes
	Stewart Scherer	National Institute of Allergy Infectious Diseases and Epidemiology \$104,466	Mobile DNA in Candida Albicaas Biology
	Patrick Schlievert	Kimberly Clark Corporation \$27,550	Characterization of Toxia Associated with TSS
	Patrick Schlievert	National Institute of Allergy and Infectious Diseases \$75,761	Cardiotoxicity of Streptococcal Pyrogenic Exotoxias
	Edwin L. Schmidt	National Science Foundation Division of Biotic Systems and Resources \$140,000	Genetic Stability of Bacteria in a Soil Ecosystem
Ophthalmology	Robert C. Ramsay	National Eye Institute \$118,778	Cyro-Rop Participating Center
Orthopaedic Surgery	Jack L. Lewis	National Institute of Arthritis Disability	Biomechanics of Anterior Cruciate Repair and Diagnosis Kidney Disease
Pediatrics	Susan A. Berry	National Institute of Arthritis Disability and Diagnosis and Kidney Disease \$98,832	Influence of Growth Hormone in Hepatic Gene Ontogeny
	Alexander Filipovich	National Cancer Institute \$95,321	Extramural Utilization of the Immunodeficiency Cancer Registry
	Patrick Horn	Pharmaceutical Manufacturers Association Foundation \$50,800	Determinants of Neuroblastoma Growth and Differentiation
	Edward L. Kaplan	World Health Organization \$2,000	WHO Collaborating Center for Reference and Research on Streptococci
	Mary Kleppel	Minnesota Heart Association \$17,500	Construction of a DNA Library to Human Kidney Cortex
	Mary E. Pierpont	Minnesota Heart Association \$24,000	Myocardial Metabolism in Turkey Cardiomyopathy
	Warren J. Warwick	National Cystic Fibrosis Foundation \$43,928	Cystic Fibrosis Care, Research and Training Center
	Thomas G. Wells	National Institute of Arthritis Disability and Diagnosis and Kidney Disease \$27,000	Research Fellowship Award
	William G. Woods	American Cancer Society \$21,777	Feasibility for Mass Screening of Neuroblastoma in Infants
	Pharmacology	Rita B. Messing	U.S. Navy \$60,000
Physiology	Richard E. Poppele	Data Sciences Inc. \$2,538	Wide Band Multi-Channel Biotelemetry System
Psychiatry	James Halikas	Eli Lilly and Company \$69,750	Fluoxetine Study
Surgery	Timothy R. Billiar	National Institute of Arthritis Disability and Diagnosis and Kidney Disease \$24,996	Hepatic Transplant Rejection
	Dixon B. Kaufman	National Institute of Arthritis Disability and Diagnosis and Kidney Disease \$26,004	Research Fellowship Award
Therapeutic Radiology	Bruce Blazar	Immunex Corporation \$20,000	Growth Factor Research Fund
	Chang W. Song	National Cancer Institute \$157,700	Biological and Physical Factors in Total Body Irradiation
	Faith Uckun	National Cancer Institute \$47,999	Radiochemosensitivity of Normal/Leukemic Progenitor Cells
	Faith Uckun	Leukemia Society of America \$93,960	Analysis of Radiochemosensitivity of Normal/Leukemic Human Bone

Over-The-Counter Pain Reliever Investigated

A "jogger's high" is not the fantasy of a jogger struggling to justify the pain he or she forces upon the body. Endorphins, hormones which occur naturally in the brain and act like morphine, may account for the high. If endorphins can be triggered to create a sense of well-being, can they also reduce pain?

Dr. Richard Eisenberg, professor and head of the department of pharmacology at the University of Minnesota, Duluth (UMD), School of Medicine, and Dr. Neil Nathan, head of the Miller Dwan Pain Control Center, answer that question with a preliminary "no." The two researchers recently set up a clinical study to determine if an over-the-counter pain reliever called d-phenylalanine, purportedly an agent which prevents the breakdown of endorphins, really does work.

According to Dr. Eisenberg, there is a growing segment of our society which strongly believes that d-phenylalanine works as a pain reliever. One can find articles in health food magazines purporting the benefits of the substance. Locally, Duluth health food stores' personnel say they stock and sell a lot of d-phenylalanine, adding that the many people who buy the product testify to its pain-relieving value.

Nevertheless, the Eisenberg/Nathan study is the first controlled test to measure the substance's effectiveness.

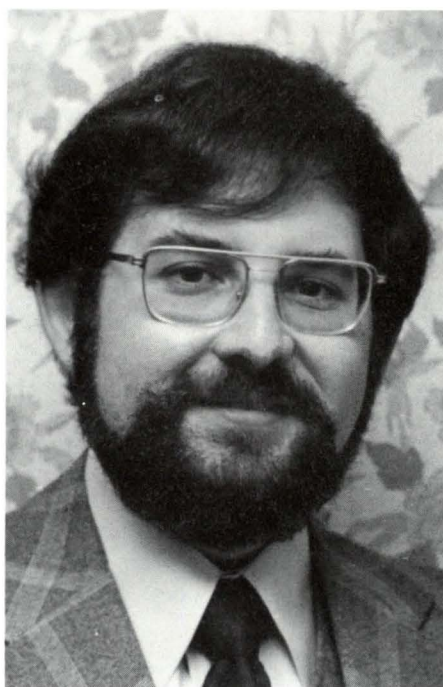
Drs. Nathan and Eisenberg selected 30 patients with chronic low back pain, some having lived with it for as many as 26 years. All the test subjects had been previously trained at the Pain Control Center on how to evaluate pain, productivity, and activity levels on a daily basis. The average patient age was 46.9 years, with an average chronic pain of 10.2 years (ranging from 2 to 26 years). Eleven of these patients had been previously operated on with little or no improvement. A total of 16 patients completed the study.

The patients were randomly selected to start with either d-phenylalanine or a placebo. Halfway through the experiment, the patients were "crossed over." Those receiving the placebo now were given the d-phenylalanine and vice versa. To ensure total impartiality, neither the patient nor the supervising personnel were aware of who was given what.

The patients completed daily self-

evaluation forms, rating on a scale of 1 to 10 pain at four time intervals, and productivity and activity levels.

"The average and total pain scores for each patient were carefully examined to determine individual differences," said Dr. Eisenberg. "Patients who tended to have variable daily pain scores over the 28-day period with the placebo also tended to show a similar pattern while taking d-phenylalanine. Similarly, patients who showed a consistent pain score throughout the four-week period while under the placebo also showed an equivalent pattern with d-phenylalanine."



Dr. Richard Eisenberg

Four of the 30 patients reported significant side effects, including muscular cramps, nausea, and dizziness, said Dr. Eisenberg. Two of the patients were forced to discontinue their participation in the study because of this, and one of the patients who continued with the program indicated that the nausea and dizziness ended immediately after the crossover to the placebo. There were no changes in urinalysis, blood counts, blood chemistry profiles, or blood pressure measurements over the course of the study.

"We concluded," said Eisenberg, "that in this pilot study, d-phenylalanine didn't help patients with chronic low back pain. Nevertheless, we're still open-minded enough to look further. Next, we hope to look at patients with different kinds of pain, particularly in arthritis and terminal cancer." □

Diabetes Research Underway At University

The University of Minnesota Hospital and Clinic, the Mayo Clinic in Rochester, and the International Diabetes Clinic in St. Louis Park are among 27 American facilities participating in a 10-year, \$150-million study to determine the best way to treat diabetes and avoid its serious medical complications.

Begun two years ago, the experiment is called the Diabetes Control and Complications Trial. It is funded by the federal National Institutes of Health with contributions from medical supply manufacturers and the 27 facilities.

"The goal is to see if tightly controlling blood sugar levels is an effective way of avoiding complications compared with the more traditional methods of daily or twice-daily insulin injections," said Dr. Oscar Crofford of the Vanderbilt University Medical School and chairman of the trial.

About 1,500 people with insulin dependent diabetes nationwide are being used as volunteers in the experiment. They receive free medical treatment for diabetes and any complications.

There are about 1 million Americans with insulin dependent diabetes. About half suffer or will suffer eye problems and severe kidney problems.

Volunteers are randomly assigned to different test groups. One group uses the traditional treatment methods of insulin injections and treatment of any complications. The other closely monitors blood sugar levels and tries to keep the levels as close to normal as possible, usually with an imbedded insulin pump.

The study is also attempting to determine if the complications are a product of diabetes itself or of high blood-sugar levels. □



MMF REPORT

MMF Board Members Named

Seven individuals were elected to four-year terms on the board of trustees of the Minnesota Medical Foundation at the annual dinner meeting in October.

MMF's board of trustees is comprised of faculty of the University of Minnesota Medical Schools, leaders in the medical community, and representatives of the corporate community. The board is charged with the overall guidance of MMF in accomplishing its missions of raising and disbursing funds for medical education and research at the University of Minnesota Medical Schools in the Twin Cities and Duluth.

Newly elected to the board were:

Dr. John B. Coleman, **Beth Erickson**, **Phyllis France**, and **Stephen G. Shank**.

Dr. John B. Coleman is past president of St. Paul Radiology Professional Association. He has previously served two terms on the MMF board of trustees, and held the office of president from 1982-84.

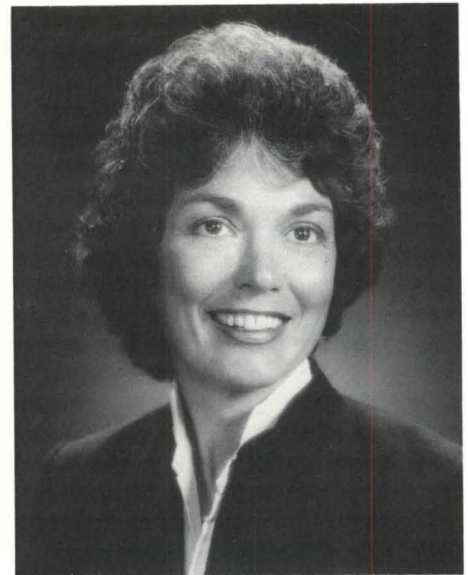
A graduate of Northwestern University Medical School, Dr. Coleman was a member of the University of Minnesota clinical medical faculty for approximately 25 years. He has been involved with numerous professional associations, including the American Medical Association, Minnesota Medical Association, Ramsey County Medical Society, Minnesota Radiologic Society, American College of Radiology, Radiologic Society of North America, and the Minnesota Academy of Medicine.

Beth Erickson is owner and president of Beth Anderson & Associates, a business involved in marketing Minnesota wild rice. She has been actively involved in the home economics area for a number of years, and started the Taste section in the *Minneapolis Star & Tribune*. She contributed food-related articles to the newspaper for 17 years, and has authored several cookbooks.

Erickson received her degree in home economics from the University of Georgia. She has been active in the Twin Cities Home Economists in Business, served on the board of trustees of the Blake School, and has been active in the Junior League.



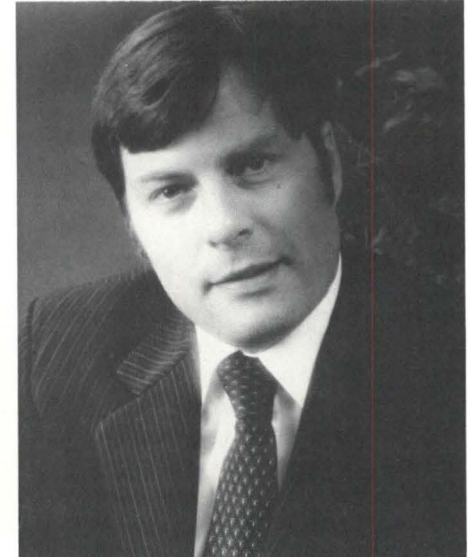
Dr. John B. Coleman



Beth Erickson



Phyllis France



Stephen G. Shank

Phyllis France is co-owner of the Canal Company Gift Shop in Duluth. She is very active in the Duluth community, serving on the boards of the Greater Downtown Council of Duluth and the Duluth State Convention Center. She is a trustee of the Bush Foundation, and also serves on the University of Minnesota, Duluth, Advisory Committee of the university's Commitment to Focus.

Stephen G. Shank is president and chief executive officer of Tonka Corporation. He has been CEO since 1979, and was secretary and general counsel of Tonka from 1974 to 1978. He practiced law prior to coming to Tonka, and is an alumnus of the University of Iowa, the Fletcher School, and Harvard Law School.

Shank is active in numerous professional and civic organizations. He is a

director of National Computer Systems, a member of the advisory committee of the Toy Manufacturers of America, a member of the Young Presidents' Organization, on the board of trustees of the Minneapolis Society of Fine Arts, and chairs the Vanguard A Division of the Minneapolis United Way campaign.

Re-elected to the board were: **Dr. Richard DeWall**, a surgeon in Dayton, Ohio, and chairman of the board of Medical, Inc., Twin Cities-based manufacturer of medical devices; **David W. Hamilton, Ph.D.**, professor and head of the department of cell biology and neuroanatomy, University of Minnesota Medical School; and **George D. McClintock**, managing partner of the Minneapolis-based law firm Faegre & Benson. □

MMF Adds Three To Development Staff

Gary G. Hargroves, **Patrick E. Shields**, and **Robert Burgett** have joined the development staff of the Minnesota Medical Foundation, according to Lowell Weber, director of development.

Gary G. Hargroves was named director of planned giving. In this position, he will be responsible for building the foundation's planned giving program. He will contact, assist, and develop prospects for planned and deferred giving, and coordinate the procedures for the administration of planned gifts.



Gary G. Hargroves

Hargroves earned a doctorate of religion from the School of Theology in Claremont, California, and was director of admissions at Athena College in Alabama and at Hamline University in St. Paul. He spent ten years with the United Methodist Church, Minnesota Conference, as executive director of Minnesota Conference Pensions, Inc.

Hargroves is active in the National Society of Fundraising Executives and the Twin City Deferred Giving Officers, and is a member of the foundation board of Hennepin Avenue United Methodist Church in Minneapolis.

Patrick E. Shields has joined the staff as development officer for the department of pediatrics. He will be responsible for coordinating the fundraising activities of the department and assisting the faculty in submitting research grant proposals, as well as increasing the visibility of the department.



Patrick E. Shields

Shields earned a Ph.D. in political science from The Ohio State University, where he also served as director of development for the College of Engineering. Prior to coming to MMF, Shields was development officer at the University of Minnesota Foundation where he served the College of Biological Sciences.

Shields is an active member of the Council for Advancement and Support of Education (CASE), vice president of the Minnesota Chapter of The Ohio State University Alumni Association, and coach at the Blaisdell YMCA in Minneapolis.

Robert Burgett was named assistant to the director of annual giving and alumni programs. He will be responsible for coordinating events for University of Minnesota Medical School alumni, assisting with MMF's annual phonethon, and maintaining other annual giving programs.



Robert Burgett

Burgett graduated from St. John's University with a bachelor of arts degree in public affairs and administration. He comes to MMF from Collegeville, Minnesota, where he served as development associate/program director for Minnesota Public Radio—KSJR. □

MMF Approves \$225,045 In Research Grants

The Minnesota Medical Foundation Board of Trustees approved \$225,045 in research grants at its fall meeting. The amount includes \$96,190 in faculty research grants, \$16,200 in student research grants, and \$112,655 in special grants for research equipment and salary support.

Faculty grants include: **Jose Barbosa**, medicine, \$6,000 for immunological studies of juvenile diabetes; **Aristidis S. Charonis**, laboratory medicine and pathology, \$5,000 to study structure and functions of the globule of the long arm of laminin; **Douglas J. Christie**, laboratory medicine and pathology, \$4,000 for detection of drug-dependent antibodies; **P. Patrick Cleary**, microbiology, \$3,600 to research the genetic basis for host specificity among group A and G streptococci; **Ronald E. Cranford**, neurology, \$1,200 for empiric study of the portability of orders to limit emergency medical treatment; **Dennis Dykstra**, physical medicine, \$2,700 to study the effects of botulinum toxin to reduce bladder outflow obstruction in spinal cord injured patients; **Dale S. Gregerson**, ophthalmology, \$4,500 to research the anti-lens antibody in phacoanaphylactic uveitis; **David W. Hamilton**, cell biology and neuroanatomy, \$5,000 to study expression of a 24,000 MW protein in the testis; **William R. Kennedy**, neurology, \$5,000 for experiments to improve the regenerative capacity of motor nerves to muscle and sweat glands; **James B. McCarthy**, laboratory medicine and pathology, \$5,000 for characterization of fibronectin receptors involved in the adhesion, motility, and metastasis of tumor cells; **R. Scott McIvor**, laboratory medicine and pathology, \$8,000 to study expression of a methotrexate-resistance gene in murine hematopoietic tissue; **Jack W. Miller**, pharmacology, \$6,000 to study regulation of muscarinic cholinergic receptors in the heart; **William D. Payne**, surgery, \$5,690 to research reversibility of liver disease associated with long-term TPN and short bowel syndrome using small bowel transplan-

tation; **Donald C. Quick**, cell biology and neuroanatomy, \$6,000 to study immunolabelling for freeze-fracture; **Barry R. Rittberg**, psychiatry, \$6,500 to study post receptor second messenger systems in an affectively ill population; **Jonathan P. Tolins**, medicine, \$4,000 to research pathophysiology of amphotericin B. nephrotoxicity; **P.E.C. Tsilibary**, laboratory medicine and pathology, \$5,000 for in vitro assembly of isolated normal and diabetic basement membrane macromolecules; **J.A. Van der Vliet**, surgery, \$3,000 to study donor specific blood transfusion and immunosuppression in rat pancreatic islet transplantation; and **Timothy F. Walseth**, pharmacology, \$10,000 to study the dynamics of cyclic nucleotide metabolism in sperm.

Student grants include: **Karen Brintzenhofe**, year 4, \$1,000 to study combination chemotherapy and adoptive immunotherapy for the treatment of established pulmonary metastatic malignancy; **Jeffrey C. Dick**, year 4, \$1,200 to research G.T.O. like receptors in the cat cruciate ligament; **Barbara E. Drevlow**, year 4, \$1,200 to study stimulus response coupling: mechanisms of bacterial lipopolysaccharide induction of endothelial cell tissue factor production; **Mark R. Freiberg**, year 4, \$1,200 to study role of calcium in e. coli-hemolysin-mediated renal tubular cell injury; **Debra R. Goldstein**,

year 4, \$1,200 to research the role of lipids in glomerular injury: evaluation of hyperlipidemia as an independent risk factor in the development of focal glomerulosclerosis; **Paul V. Hautamaa**, year 4, \$1,000 to research vasomotor properties of the mature coronary collateral circulation; **Julie K. Lesser**, year 4, \$1,200 to study distribution of fibronectin in human heart tissue in normal and pathologic conditions; **Diane Metzler**, year 4, \$700 to study automobile driving behavior of patients with Alzheimer's disease; **Scott D. Nygaard**, year 4, \$1,200 to research circadian-stage dependent antitumor activity of recombinant tumor necrotic factor (r TNF) against the meth-a sarcoma; **Patrick J. O'Brien**, year 4, \$800 for chart review of patients with arterial bypass grafts: symptoms at presentation and evaluation at five-year follow-up; **Victoria Puumala**, year 4, \$1,200 to study superoxide dismutase activity in renal ischemia; **Jennifer G. Robinson**, year 4, \$300 to study the effect of ultraviolet light therapy on fractionated serum bile acids and pruritis in hepatic cholestasis; **Deborah R. Ross**, year 4, \$800 for development of a written mental status examination for evaluating Hmong patients; **Soren A. Ryberg**, year 4, \$1,200 for development of a clinical means by which to better detect early dementia; **Mark D. Sawyer**, year 4, \$400 to study adoptive

immunotherapy of cancer: enhancement of the local anti-tumor; **Gene Shaw**, year 4, \$1,200 to research effects of urea and an acute protein load on the renin-aldosterone-angiotensin system; **Neil B. Sjulson**, year 4, \$1,200 to study immunohistochemical features of prognostic significance of carcinomas of the bladder; and **Garry V. Walker**, year 3, \$1,200 to study the effect of TNF on eosinophil mediated endothelial damage.

Faculty special grants include: **Leo T. Furcht**, laboratory medicine and pathology, \$25,000 for cooperative equipment request for a gamma counter; **Nelson D. Goldberg**, pharmacology, \$29,625 for a gas chromatograph-mass spectrometer for analysis of the dynamics of cellular cyclic nucleotide metabolism; **Edward L. Kaplan**, pediatrics, \$20,000 for interim support of WHO Collaborating Center for reference and research on streptococci; **Steven A. Seelig**, pediatrics, \$9,830 for shared computing facility for molecular biology; **Timothy F. Walseth**, pharmacology, \$15,000 to study dynamics of cyclic nucleotide metabolism in sperm; and **Chester B. Whitley**, pediatrics, \$13,200 for newborn screening program for mucopolysaccharidosis (MPS) storage diseases: pilot studies. □

Financial Planning And Management Workshop Held

National Medical Fellowships, Inc. and the Minnesota Medical Foundation were sponsors of a fall workshop on financial planning and management targeted to minority students in medicine.

Panel discussions addressed the subjects of: Financial Medical Education, Aspects of Credit and Debt, Financial Planning Now and in the Future, and Becoming a Physician. Small group discussions and case study reports were part of the day's program as well.

National Medical Fellowships, Inc., headquartered in New York, is a non-profit organization providing scholarship assistance to minority groups in medicine. It has been a source of financial assistance and information for minority medical students for over 40 years.

Through its educational programs



From left to right: **Dr. Arthur W. Kaemmer**, chairman of the Minneapolis-St. Paul Advisory Committee of National Medical Fellowships; **Al Walls**, director of scholarships, New York headquarters of NMF; **Manuel Hernandez**, 4th year medical student.

and publications, the organization addresses the special needs of minority students for information about financial planning and management.

Since the establishment of the Hugh J. Andersen Memorial Scholarship

Program in 1982, NMF has made 13 awards totaling \$32,500 to minority students attending medical school in Minnesota. It has awarded another 27 need-based scholarships totaling \$48,500 during the same period. □

Successful Parents' Day Held

The eleventh annual Parents' Day, held in October, brought over 280 parents of first-year medical students to the university campus. The informative program included welcoming talks by Paula Garrett of the Medical Student Council, David Teslow of MMF, Inge Schwochau of the Parents' Committee, and Dean David Brown.

Inge Schwochau reviewed the functions of the Parents' Committee in her remarks: to assist the students directly or indirectly in various areas of concern; to cooperate with the Minnesota Medical Foundation and the Student Council in sponsoring several programs during the school year and one annual scholarship fundraising event; and to provide parents with information about the medical school.

Associate Dean Sullivan gave a profile of the 1986-87 freshman class, and Dr. Robert McCollister explained the medical school curriculum to the parents. Gregory Goblirsch and Heidi Street entertained the guests with a slide show depicting a student's perspective of the first few weeks of medical school. The financial aid programs were explained by Helene Horwitz of MMF.

The parents were taken on tours of the medical school facilities, and were treated to first-hand explanations of their students' courses by several professors. Following lunch, Assistant Dean Pearl Rosenberg spoke to the parents on "The Care and Feeding of Medical Students."

Parents attending came from eight states in addition to Minnesota. □



Parents visit medical school classrooms during Parents' Day tours.

Medical Students' Benefit Variety Show Announced

February 28 is the date for the second annual benefit variety show put on by University of Minnesota medical students. Last year's program was a great success, due to a strong commitment to the purpose of the event by the students. A wide variety of talent was brought to the show, which grossed over \$10,000.

Proceeds from last year's show have been used to establish scholarships for students with unusually high debt levels, and \$5,000 has been set aside for the establishment of an endowment fund. Proceeds from this year's event will be used to reach the \$10,000 mini-

um for the endowment, and will help ease the financial burden for as many students as possible.

This year's benefit will showcase the singing, dancing, and comedic talents of the medical students of the University of Minnesota. It will be held at the Northstar Ballroom of the St. Paul Student Center on the St. Paul Campus. Sponsors are the University of Minnesota Medical Student Parents' Committee, the Medical Student Council, and the Minnesota Medical Foundation.

For more information, call MMF at 625-1440. □

Thorpe Foundation Awards \$50,000 For Adolescent Suicide/Depression Research

The James R. Thorpe Foundation has awarded \$50,000 to the division of child and adolescent psychiatry at the University of Minnesota Medical School through the Minnesota Medical Foundation. The grant, which equals the largest ever made by the Thorpe Foundation, will support continuing comprehensive research on adolescent depression and suicide.

The project, headed by Dr. Barry

Garfinkel, professor and director of child and adolescent psychiatry, began more than a year ago. Recently Dr. Garfinkel and his associates disclosed the results of an initial survey, which focused on 3,600 high school students in 52 nonmetropolitan counties.

The survey—the first of its kind in the country—found that 2.7 percent of outstate Minnesota students had attempted suicide in the previous month, 5.9 percent had attempted it in the preceding six months, and 9 percent were severely depressed. More than one-third of the students had experienced some degree of depression.

These figures, Dr. Garfinkel observes, were much higher than originally anticipated.

Drawing upon their discoveries, the researchers have devised a new initiative which specifically targets several high schools where the recent incidence of adolescent suicide is disproportionately high. They will look at characteristics of young people at high suicide risk in order to define more precisely effective prevention programs.

In a later phase of the program, the researchers will survey an additional 15,000 students in the Twin Cities metropolitan area. □

MMF Recognizes Award Winners

Through its scholarship and awards programs, the Minnesota Medical Foundation recognizes outstanding achievement and assists medical students faced with high debt levels. The following scholarships and awards were presented this fall by MMF: *Alpha Omega Alpha Scholarship*, a \$1,500 award made possible by a grant from the AOA Honor Society, presented to **Lisa Bucholz** in honor of her outstanding achievement during her first year of medical school; *American Cancer Society Scholarship*, a \$1,200 award established with a grant from the American Cancer Society, presented to **Paul Sovell** and **David R. Edwards** for demonstrated superior academic achievement and financial need; *Delia Tenille Hobbs Scholarship*, a \$750 award made possible through the generosity of John Hobbs, M.D., presented to **Hisman Percival** for superior academic achievement and financial need; *Nicollet Clinic Founders Scholarship*, \$500 awards given to **Lisa K. Lund**, **Joanne Z. Riley**, **Chris Longbella**, and **L. Dean Jansen** for superior academic achievement and financial need; *Ruth Boynton Scholarship*, \$500 awards given in honor of Dr. Ruth Boynton to **Julie Drier**, **Ann Apalsch**, **Naomi Olson**, and **Caroline Mason** for superior academic achievement and financial need; the *Nicolette Norton Scholarship*, a new \$500 award given to a medical student planning a career in pediatrics. The funds to support this endowed scholarship have initially been provided by Mr. Thomas Grossman and the Metropolitan Corporation to memorialize Nicolette Norton, daughter of Mr. and Mrs. David Norton. **James Dufort** is the recipient of this award; the *Parents' Scholarship*, \$500 awards presented to **Richard Nelson**, **Michael Butts**, **Stephanie Hedstrom**, and **Mark Thomas** as a result of funds made available from the Medical Student/Parent Scholarship Benefit held last March; and the *J. Jacob Kaplan Research Award*, a \$1,500 research achievement award established from an endowment from the late Dr. J. Jacob Kaplan, presented in the field of gastroenterology to **Merrill A. Biel**. □

Lions Give \$200,000 For Hearing Research

The Lions Multiple District 5M Hearing Foundation, Inc. has presented a check for \$200,000 to the Minnesota Medical Foundation as the first payment toward establishing the Lions Hearing Research Endowment Fund to benefit hearing research in the department of otolaryngology.

The purpose of the fund is to enrich and expand education and research in hearing in the department of otolaryngology, and to provide permanent funding for hearing research at the University of Minnesota. The total

amount of the permanent endowment is \$500,000, to be contributed by the Lions over the next five years.

The University of Minnesota Medical School, the Minnesota Medical Foundation, and the department of otolaryngology are extremely grateful to the Lions Multiple District 5M Hearing Foundation, and are excited about the continued research in hearing problems that will occur here at the university as a result of the endowment fund. □



From left to right: Morey Weisgurt, Lions District 5M Hearing Foundation member; Dr. Jack Duvall, head of the department of otolaryngology; Dr. David Brown, dean of the medical school, David Teslow, MMF executive director; Gordon Oliver, Lions chairman; Bob Winter, Lions treasurer; and William Landwehr, Lions vice chairman.





Russell Bennett, campaign chair; Dr. B.J. Kennedy, division head of medical oncology, and Rudolph Miller, MMF board member, enjoy the Minnesota Campaign festivities in October at the Radisson South Hotel.

Minnesota Campaign Tally

The Minnesota Campaign has raised more than half of its \$300 million goal about one year into the three-year campaign. The \$168 million that had been raised as of October includes \$80 million in leadership gifts and \$23 million from the Permanent University Fund. The amount was announced at the October 8 National Leadership Homecoming dinner at the Radisson South Hotel. (As of December 1, the total amount raised has increased to \$188.5 million.)

"In two years we will be able to say that we did something that could only be done here, through superior cooperation by the public and private sectors," said Russell Bennett, campaign executive committee chair.

The 3M Foundation and 3M employees announced in October that they will donate up to \$3 million to the Minnesota Campaign. The gift is the largest cash donation ever made to the university by a public corporation and its employees, campaign officials said. The donation will be spread over five

years, from 1987 to 1991, and the total benefit to the Minnesota Campaign fund could exceed \$6 million because of matching gifts and other grants.

A neurosciences chair will be established in the medical school as a result of the 3M gift. The 3M Bert Cross Neurosciences Chair will support research in the basic mechanisms of nerve function, with emphasis on vision research. Bert Cross is a former chief executive officer of 3M.

The Minnesota Chapter, Arthritis Foundation, has announced a gift of \$500,000 to establish the Arthritis Foundation Land Grant Chair at the medical school.

The Minnesota Campaign, led by Minneapolis business leader and university alumnus Curt Carlson, is seeking \$300 million in contributions during the next two years. The university hopes to establish at least 100 new faculty chairs or professorships. Forty-nine positions have been created since the campaign began.

ALUMNI UPDATE

Dear Colleagues:

Winter arrived early in Minnesota this year, and that may be the reason the Medical Alumni Society has focused attention on June activities. We are anticipating what is to come.

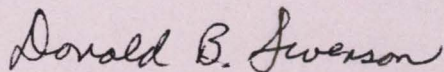
We are anticipating the very best class reunions ever on June 5, 1987. Two board members, Nadine Smith, M.D. '52 and Richard A. Carlson, M.D. '72, are serving as co-chairs of this year's reunions. They and the six class reunion chairs are building upon a very fine tradition that was begun last year. Last June, for the first time, all classes held reunions in the same location, the University Radisson Hotel. The all-alumni reception for the medical school was held before the reunion classes adjourned to private rooms for their banquets and reunion programs. I served as co-chair for my 35th reunion last year and am proud to report that last year's reunions were the best ever, not only in my judgment. The Minnesota Alumni Association awarded one of three recognition awards to the medical school for its 1986 reunion program. I accepted the award on behalf of the society at the annual fall Leadership Day. I am proud of what we accomplished last year, and I'm also aware that this year's reunion chairs are planning to outdo us!

We are anticipating the class lists will be corrected on the new computer system by June. Work has begun in earnest to prepare class lists that are accurate. We need your help. You will receive mailings from the Medical Alumni Society in the months ahead that will help us develop a good list of each class; please return your response quickly. Included in this issue is a letter from one member of the Class of 1961 who nearly missed the 25th reunion of his class. We want to ensure that no one misses a reunion for the same reason.

We are anticipating a highly successful continuing education seminar, New Horizons, in conjunction with our reunions on June 6. The board members are reviewing past seminars and exploring new ideas to make the 1987 program a valuable learning experience. All of us are inundated with notices of opportunities for CME credits. The New Horizons seminar offers special opportunities for alumni to be introduced to the research projects of today's faculty at their alma mater. More information will be mailed to you from the Medical Alumni Society in the weeks ahead.

We are anticipating ways to improve communication with you—the alumni of the medical school. One of our goals is to make communication between the medical school and you as effective and easy as possible. The board members are gathering information and discussing ideas at this point. We need your thoughts on what works and what doesn't. By June, we intend to implement the first of our ideas for improved communication among alumni.

Sincerely,



Donald B. Swenson, M.D., '51
President
Medical Alumni Society

June Is Reunion Time

Mark your calendars for June 5 and 6. Reunion activities are being planned for:

Class of 1937—50th reunion
Dr. Arnold Kremen—Chair
510 Groveland
Apartment 522
Minneapolis, MN 55403

Class of 1947—40th reunion
Dr. George W. Janda—Chair
825 South Meadow Lane
Golden Valley, MN 55416

Class of 1957—30th reunion
Dr. John A. Nilson—Chair
12 Woodland Road
Edina, MN 55424

Class of 1962—25th reunion
Dr. David E. Culligan—Chair
316 Stonebridge Boulevard
St. Paul, MN 55105

Class of 1967—20th reunion
Dr. Daryl Brockberg—Chair
9 Spyglass Road
Dellwood, MN 55110

Class of 1977—10th reunion
Dr. John O'Leary—Chair
2621 57th Street West
Minneapolis, MN 55410

See Dr. Swenson's letter for more reunion information. Questions about the reunions may be directed to the Minnesota Medical Foundation, (612) 625-1440.

Harold S. Diehl Award Announced

The committee for the Diehl Award, given annually by the University of Minnesota Medical Alumni Society, solicits nominations from physicians of Minnesota. The award, named for Dr. Harold S. Diehl, dean of the medical school from 1935 to 1958, is presented to one physician annually who has met the following criteria:

- 1) Preferably an alumnus of the University of Minnesota Medical School.
- 2) Not engaged in an academic capacity.
- 3) Has made outstanding contributions to the Medical School, the University, the Alumni, and the community.
- 4) Has had a relatively long experience in the field of medical science or a related field.

Nominations for the Award, to be presented in June 1987, should be sent to:

N.L. Gault, Jr., M.D., Chairman
Harold S. Diehl Award Committee
UMHC Box 193, 420 Delaware St., S.E.
Minneapolis, MN 55455

Nominations should include supporting documents and references that will assist the committee in its deliberations.

Calling All Lost Alumni

The following letter was received last spring from a "missing" medical school alumnus. This year, we hope things will be different. We have a new computer system in place and are updating all our lists. But we need your help! Please keep us informed of your whereabouts.

Dear Medical Alumni Society:

I graduated from the University of Minnesota Medical School in 1961, or at least I thought I did. I just checked, and my University of Minnesota diploma still hangs on my office wall and I'm proud of it. I also have licenses to practice medicine in both Minnesota and California, and proof of medical school graduation is essential to obtain them. I trained in internal medicine and psychiatry at the Mayo Clinic and completed psychiatry residency at U.C.L.A.'s Neuropsychiatric Institute. Proof of medical school graduation is required for acceptance at both institutions. I have been an assistant clinical professor of psychiatry at U.C.L.A. Medical School for 17 years, and they allow only medical school graduates to hold such positions. I'm a member of my county, state, and national medical and specialty associations. I was chief of staff at my hospital for three years and am presently the physician elected by the medical staff to the hospital's board of directors. It would create a major scandal here if it should be rumored that I forged my University of Minnesota credentials.

The reason I am writing this letter is that for months my friend, neighbor, and medical school classmate Howie Higholt, a prominent local radiologist, has been talking about the big 25th reunion of our class on June 6th. He got me so enthused about it that I invited my friends and classmates, Mac Peterson from LaJolla and Dave Folkestead from Phoenix and their wives to come up to Los Angeles and join my wife, Gabriella, and Howie and me on the flight to Minneapolis for the reunion.

I thought it rather odd that I never received anything in the mail on it. So last Friday I called Howie and asked him to drop the reunion information off at my house on his way home. He did, and when I looked at the Class of 1961 roster, I found that I have been eliminated! Just like that! In the process of planning a trip to Minneapolis for my 25th, I suddenly discover that I am no longer in the class! How humiliating! I've suddenly become a nonentity, a nonperson, a nonevent in my own alma mater! I've considered the following possibilities:

1. Premature rumors of my untimely demise have reached your office.

It's true, I did leave Minnesota and the Mayo Clinic in 1966 at the height of the Vietnam War to enter the Navy and never returned. But rumors to the contrary notwithstanding, I survived, was discharged a Lieutenant Commander and resurfaced in Southern California where I have been ever since.

2. My medical school purged me from its roster because I forsook Minneapolis for the West Coast.

I was ready to plead that Minneapolis remains my favorite city and I'm here only because I could no longer tolerate the frigid winters. Then I rechecked the list and discovered plenty of my classmates are on the West Coast.

3. My medical school ostracized me because I ended up a psychiatrist.

I was ready to plead that I was in family practice in Minneapolis and internal medicine at Mayo before entering psychiatry and that I employ the full spectrum of somatic treatment modalities. Then I rechecked the list and found plenty of psychiatrists among my classmates. In fact it looks as though, if the psychiatrists from our 1961 class were to abandon Minneapolis and St. Paul, the Twin Cities would go psychotic!

4. I was dropped because I haven't donated enough to the alumni fund.

I was ready to explain to you that four of our children are in college now, with three more to go. I was ready to promise to donate plenty after they graduate. Then I rechecked the list and discovered so many cheapskates that there's just no way I could be low man on the donation list!

5. Involvement in Medical Fraternity pranks is now a basis for expulsion from the alumni roster.

I was ready to explain that I was innocent of acts of which I was accused and to reveal the real culprits to you at long last. Then I noticed the list was full of notorious pranksters!

Having eliminated all possibilities which come to mind, what can I do to be restored to the 1961 class roster, and secure an invitation to the 25th reunion at the Radisson University Hotel on Friday, June 6th? If I am restored, will you please send me copies of all mailings on the subject and let me know what time the festivities begin on Friday? I'd ask for all the alumni mailings I've missed since leaving Minnesota for the Vietnam War in 1966, but I'm a slow reader.

Sincerely,

Henry G. Moeller IV, M.D.
Class of 1961?

CLASS NOTES

1946

Dr. Harold O. Perry, Rochester, Minnesota, has been awarded the foreign Sulzberger Lectureship by the American Academy of Dermatology. This lectureship provides funds for a five-week lecture tour at universities in Tokyo and Kyoto, Japan; Beijing, China; Taipei, Taiwan; Singapore and Kuala Lumpur.

1962

Dr. Paul F. Engstrom, Ambler, Pennsylvania, vice president for cancer control and continuing education at Fox Chase Cancer Center in Philadelphia, has been named to a four-year term on the board of scientific counselors for the National Cancer Institute (NCI) Division of Cancer Control and Prevention. This board has primary responsibility for providing scientific advice to the NCI director and for reviewing the progress of programs funded by the cancer control division. At Fox Chase, Dr. Engstrom is principal investigator for the center's cancer control science program, one of only four NCI-funded programs of this kind.

Dr. John E. Sutherland has been named professor and chairman of the department of family practice at Southern Illinois University School of Medicine. Dr. Sutherland was formerly program director of the affiliated community hospitals residency in family practice at the University of Minnesota. His publications have appeared in various medical journals, and he co-authored a chapter in the third edition of the textbook *Family Medicine: Principles and Practice*.

1969

Dr. William Keye, Park City, Utah, has edited two books during the past year: *Laser Surgery in Obstetrics and Gynecology*, and *Premenstrual Syndrome*. He taught laser surgery to an international group of physicians at the World Congress of Fertility and

Sterility in Singapore and the Australian Fertility Society in Adelaide, and in March will address the Australian Society of Psychosomatic Obstetrics and Gynecology on premenstrual syndrome and the emotional impact of infertility. The meeting will be held in Tasmania. Dr. Keye is currently associate professor of obstetrics and gynecology and chief of the division of reproductive endocrinology at the University of Utah Medical Center, Salt Lake City.

1970

Dr. Jay Noren has been named vice chancellor for health sciences at the University of Wisconsin, Madison. He has been a member of the Center for Health Sciences administrative staff since 1982, and has been serving as acting vice-chancellor for health sciences. Dr. Noren oversees the operation of health-related programs at the university, including UW Hospital and Clinics, the Medical School, School of Nursing, School of Pharmacy, School of Allied Health Professions, State Laboratory of Hygiene, and University Health Service.

1972

Dr. Charles S. Field, Rochester, Minnesota, has been elected vice chairman of the Minnesota Section of the American College of Obstetricians and Gynecologists (ACOG) for a three-year term. In private practice in Rochester, Dr. Field is affiliated with Rochester Methodist and St. Mary's Hospitals. He is also an assistant professor of obstetrics and gynecology at Mayo Medical School.

1976

Dr. Timothy A. Newman, Bloomington, Minnesota, has been named a director of medical services for Prudential Life Insurance Company. He is one of five medical directors in the individual life insurance facility of Prudential in Plymouth.

1979

Dr. Richard J. Sveum, Minnetonka, Minnesota, has joined the allergy department of Park Nicollet Medical Center. From 1983 to 1986, he was a Medical Staff Fellow at the National Institute of Allergy and Infectious Diseases of the National Institutes of Health in Bethesda, Maryland.

1980

Dr. Louis Binder, El Paso, Texas, has been named an assistant professor in the department of surgery, division of trauma and emergency medicine, at Texas Tech University Health Sciences Center, El Paso. He is active in both graduate and undergraduate medical education in emergency medicine, and has participated in the school's admission committee, grading and promotions process, and student affairs. In addition, he has been active in the committee structure of both the Society of Teachers of Emergency Medicine and the University Association for Emergency Medicine.

Dr. Valorie Sweeney Domino, Springfield, Illinois, has been named assistant professor of child and adolescent psychiatry at Southern Illinois University School of Medicine. She previously served as psychiatric medical director of the Anorexia and Bulimia Treatment and Education Center in Beaver, Pennsylvania.

1983

Dr. Kathleen M.L. Ayaz, Minneapolis, Minnesota, is serving as chief resident in internal medicine at Abbott Northwestern Hospital. This is a one-year appointment from July 1986 to July 1987. □

In Memoriam

Dr. Richard E. Aronsen,

Class of 1954, died November 7 at his home in Dunwoody, Georgia, at the age of 60. A former Golden Valley, Minnesota, physician, Dr. Aronsen graduated with honors from the medical school, and practiced medicine for the next 31 years. He was past president and chairman of the Hennepin County Medical Society, past president of the Hennepin County chapter of the Academy of Family Practice, past chief of staff at Eitel Hospital, and past president of the University of Minnesota "M" Club. In 1973 Dr. Aronsen received the Shotwell Award from Metropolitan Medical Center in Minneapolis for "noteworthy efforts in the health care field." He also was vice speaker at the house of delegates for the Minnesota Medical Association, and spoke out on political-medical issues. He retired in 1985 and relocated to Georgia. He is survived by four daughters.

Dr. Carl G. Caspers,

Class of 1937, died October 18 at the age of 76 in Minneapolis. Dr. Caspers was an orthopedic surgeon in the Twin Cities for 45 years. He was a member of the American Academy of Orthopedic Surgeons and the 20th Century Orthopedic Association. Dr. Caspers was a major in the Army during World War II and served in New Guinea. He is survived by his wife, Bernadette, two sons, four daughters, seven grandchildren, and one brother.

Dr. Orest N. Filipovich,

Class of 1953, of Golden Valley, Minnesota, died November 29 at the age of 63. He was a surgeon at Abbott Northwestern and Fairview Southdale hospitals for the past 21 years. Dr. Filipovich was chairman of the department of surgery at Abbott Northwestern in the late 1970s, and, since 1977, an associate clinical instructor at the University of Minnesota Medical School. He is survived by his wife, Katherine, two daughters, a son, and his mother and brother.

Dr. Youbert T. Johnson,

Class of 1929, Bloomington, Minnesota, died on November 17. He was in general practice in Minneapolis. He is survived by his wife, three sons, two daughters, and a nephew.

Dr. William R. Kostick,

Class of 1933, Minneapolis, (formerly of Fertile, Minnesota), died December 3. Dr. Kostick was in general practice. He is survived by two sons, three daughters, 14 grandchildren, 5 great grandchildren, and a sister.

Dr. Bernard G. Lannin,

Class of 1937, Healdsburg, California (formerly of St. Paul), died November 28 at the age of 71. Dr. Lannin was a surgeon in St. Paul for nearly 40 years. He completed a doctorate in surgery from the University of Minnesota in 1944. He was on the staff of Miller, Children's, and Midway hospitals in St. Paul, and was an associate clinical professor of surgery at the University of Minnesota. He is survived by his wife, Noreen, two daughters, and a brother.

Dr. Lillian Olson-Nelson,

Class of 1935, died October 1 in Moorhead, Minnesota, at the age of 79. She served her internship at Minneapolis General Hospital, then went to China in 1936 as a medical missionary. She was detained in a concentration camp in the Philippine Islands during World War II and was unable to return to the United States until 1946. From 1947 to 1962 she was on the staff of the Minnesota State Tuberculosis Sanatorium at Ah-Gwah-Ching, Minnesota. In 1964, she joined the Bemidji Clinic but returned to Ah-Gwah-Ching as medical director in 1966. In 1975 she became a general practitioner in Clarissa, Minnesota. She married the Rev. Hans Nelson in 1979 and retired from private practice.

Dr. Francis I. Sabo,

Class of 1932, died in September. He had been living in Bozeman, Montana.

Dr. Elmer H. Tofteland,

Class of 1938, died on June 20.

We have also received notice of the following deaths:

Joseph H. Bramson,

Minneapolis, died October 13 at the age of 80. He was a former owner of Levin Brothers Manufacturing Company in Minneapolis. Bramson was a supporter of the University of Minnesota Medical School, and requested that a fund for cancer research be established after his death.

Raymond M. Scallen, Ph.D.,

San Gabriel, California, died November 22 at the age of 32. He is survived by his parents, Dr. and Mrs. Raymond W. Scallen, Minneapolis; three sisters, a nephew, grandparents Mr. and Mrs. Lawrence Teberg, and Mrs. Raymond A. Scallen. □



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HISTORICAL PERSPECTIVE

The First Cholecystectomy in America

A century ago, on September 24, 1886, at St. Joseph's Hospital in St. Paul, Dr. Justus Ohage introduced to America a new and important surgical operation—the removal of the gallbladder. Before surgical treatment of gallbladder disease became available, its victims suffered excruciating pains and severe, frequently disabling illness that could last for years before it ended in premature death. Physicians might give opiates to ease the pain, but they could do little else.

Joseph Lister's introduction of antiseptic surgery opened up the whole field of abdominal surgery, making surgical operations on the gallbladder practicable. In Berne, Switzerland, in June of 1878, Dr. Theodor Kocher performed a cholecystotomy, opening a patient's gallbladder to remove gallstones but leaving the gallbladder in place.

On February 24, 1886, Dr. Ohage had performed a cholecystotomy on a 42-year-old married woman, the mother of several children, who for 20 years had been chronically ill from gallbladder disease. When Dr. Ohage examined her, he found a slender, gaunt woman in severe pain with an oval swelling on the right side of her abdomen. He operated successfully to open the gallbladder and remove the stones blocking the duct. However, the operation left the patient with a pinhole fistula, opening into the gallbladder, that occasionally became painful and discharged mucus.

When a second patient, a 35-year-old married woman, also a mother of several children, came to Dr. Ohage on September 23, 1886, suffering from an acute gallbladder attack, he decided

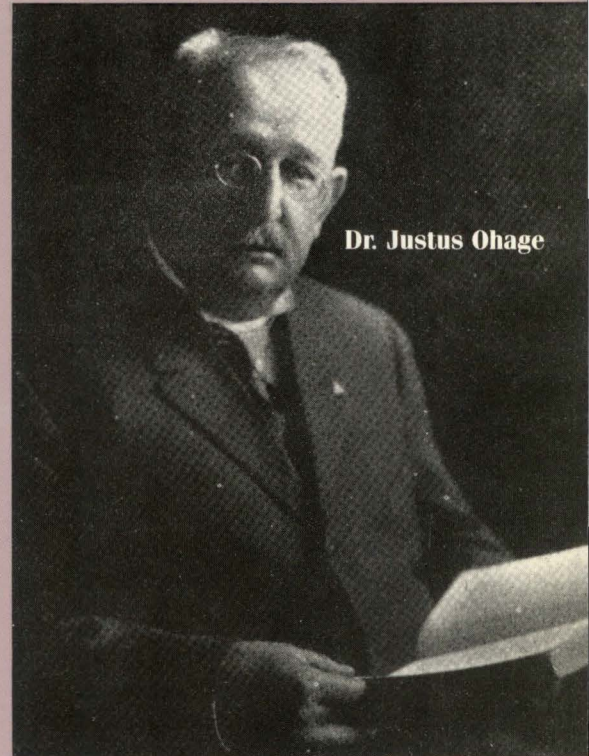
to remove her gallbladder—both to avoid creating a fistula that would not heal, and, because she was still young, to prevent recurrence of the bile duct obstruction from which she had suffered only a short time. The operation, performed the next day, was successful; the patient recovered without complications and left St. Joseph's Hospital to go home two weeks later.

Dr. Ohage's operation was the first removal of a gallbladder in the United States and only the ninth in the world. It was first proposed in 1883 by Dr. Bernard Langenbeck of Berlin, who had performed it five times. Among the nine patients operated upon, there had been only one death, that from an undetected ulcer of the bile duct. "This is certainly a triumph of modern surgery," exclaimed Dr. Ohage, "where nine lives (instead of one) would have perished but for surgical interference."

Dr. Ohage's pioneering success in removal of a gallbladder was not accidental, but the result of thorough preparation. Before he attempted the cholecystectomy on his first patient in September, 1886, he had performed the operation a number of times on dogs to perfect the surgical technique required. In addition, his whole medical training had contributed to his preparation.

A native of Hannover, Germany, where he was born October 13, 1849, Dr. Ohage was the son of a physician. As a youth, he ran away to America where he served with the U.S. Army in the Civil War. While he lay wounded in a hospital in City Point, Virginia, in April, 1865, President Lincoln stopped at his cot to thank him for his service.

By Leonard G. Wilson, Ph.D.



Dr. Justus Ohage

On his return to Germany, Dr. Ohage began to study medicine at Hannover, but interrupted his studies to pursue hunting adventures in America. He later resumed his medical studies in the United States and in 1880 received an M.D. degree at the University of Missouri. He then returned to Europe for the further study of surgery in Germany and Great Britain. In May of 1881 he began practice in St. Paul where he soon became highly respected as a surgeon. In the late 1880s, Dr. William W. Mayo was accustomed to sending his sons Will and Charles to St. Paul to watch Dr. Ohage operate.

Leonard G. Wilson, Ph.D., is chairman of the History of Medicine Department at the University of Minnesota



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CALENDAR OF EVENTS

Burn Care Update

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February 6

Topics in Geriatric Medicine: Drug Symposium VIII

Radisson University Hotel, Minneapolis
CME (612) 626-5525

March 4-5

Fifth Annual Critical Care Conference

St. Paul-Ramsey Medical Center, Ramsey Clinic
CME (612) 221-3992

March 4-7

Psychiatry: Diagnostic and Statistical Manual R-III

Radisson University Hotel, Minneapolis
CME (612) 626-5525

March 13

Eighth Annual Occupational Medicine Update

St. Paul-Ramsey Medical Center, Ramsey Clinic
CME (612) 221-3992

March 20-21

Pulmonary Function Testing Workshop

St. Paul-Ramsey Medical Center, Ramsey Clinic
CME (612) 221-3992

April 1-3

Clinical Strategies in Primary Care Medicine

St. Paul-Ramsey Medical Center, Ramsey Clinic
CME (612) 221-3992

April 2-4

The Spectrum of Colon and Rectal Diseases in Primary Care

Radisson University Hotel, Minneapolis
CME (612) 626-5525

April 3-4

Pediatric Ophthalmology and Strabismus

Holiday Inn Downtown, Minneapolis CME
(612) 626-5525

April 6-7

Obstetrics & Gynecology Update

St. Paul-Ramsey Medical Center, Ramsey Clinic
CME (612) 221-3992

April 9-10

45th Annual Course in Allergy and Clinical Immunology

Mayo Memorial Auditorium, University of Minnesota, Minneapolis
CME (612) 626-5525

April 9-11

Eating Disorders

Earle Brown Center, University of Minnesota, St. Paul
CME (612) 626-5525

April 10-11

Family Practice Review: Update '87

Radisson South Hotel, Bloomington
CME (612) 626-5525

April 20-24

Respiratory Problems of the Immuno-suppressed Patient

St. Paul-Ramsey Medical Center, Ramsey Clinic
CME (612) 221-3992

April 24-25

Alzheimer Patients: Toward a Standard of Care

CME (612) 626-5525

April 28-29