Duck out for lunch in Forest Park on an early Spring day, and you'll hear singing birds and herds of joggers thudding along the path. In counterpoint to the seasonal melody and rhythm is the young man above, perhaps reflecting on the Washington University Medical Center in the background.
On the cover:
Steel engraving of a photo by James Lanier, M.D. '66, as he and his sled dog team head for the mountains in Alaska. The adventure story begins on page 2.

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Mushathon Man!

by Casey Croy

What James Lanier, M.D. '66, did in February and March of 1979 could be called a marathon, if you like understatement. As marathons go, Lanier's race makes the fabled Boston Marathon seem like a Sunday stroll in a spring garden. One obvious difference is that man alone is not the competitor; there is the animal element. And that requires teamwork and the unity of man and beast, as in a horserace. But as horseraces go, Lanier's race makes derbies seem sweet and serene. After all, marathons and derbies have been refined by generations of competitors in societies of culture, learning and law. This race is rooted in a primitive culture and propagated in the wilderness in winter. Its heritage began not thousands of years ago, but only 150, give or take a few. The sense of history is strong and fresh. In fact, the race is a memorial to a legendary hero, Leonard Seppala, a Norseman whose saga is told by men who knew him and is known among natives and newcomers alike. The race's first starting position is reserved for him and every year it stands empty, as eloquent as the winter wilderness. Competitors hope for the luck of the draw to get position number two for this race which London's Radio Times called "The Last Great Race On Earth.

This is the story of the pathologist who came through in the cold, "Mushathon Man" Jim Lanier, who went the full distance, conducted medical research on the trail, provided emergency treatment instructions for the care of an isolated burn victim, raised $13,500 for a new frostbite/burn unit at his hospital, survived the threats of foul weather and his own mind, and plans to endure it all again!

Iditarod — a river, a town, a region, a race, a National Historic Trail and, for many Alaskans, a way of life because it is the true test of stamina and courage so long essential to life in the north, a test which uniquely unites the state every year to honor and continue those values. "Mushing" teams is the official state sport of Alaska. Men and women from their teens to their sixties compete in sprints and distance events of a few hundred miles. Even young children compete in junior races. But the Iditarod is what it is all about. The race is named for the trail which was named for the town on the Iditarod river. It was a boom town in the 1890s gold rush days. Today, one family lives there, a family with reason to be glad that Jim Lanier wasn't too far away on March 2, 1979, mushing on through a ground blizzard. During the heyday of the goldrush, the town grew as a mining camp and hub of trail-based transportation and mail service. Then, the Iditarod Trail was nearly as heavily traveled as, perhaps, the road between Dodge City and Kansas City in the era of gunslingers and cattle drives. Dog sleds delivered mail, tools and medicine for townspeople and miners, following the old trail which had been used by generations of Athabascan Indians and Eskimos long before the first white men, Russians, came to Alaska.

In the 1920s in the 48 states of the union, people were listening to Duke Ellington, driving their model Ts past Burma Shave signs, and listening to radio broadcasts about Charles Lindbergh's historic flight. However, the Alaska Territory was still a frontier, and the Iditarod Trail was a major freeway, especially in winter. Railroads were being built, but expansion couldn't keep pace with rapid development of mining camps in the Klondike days. The Alaska Road Commission continued to survey and stake trails and establish sites for roadhouses a dog-sled-day's drive apart. The two world wars depleted mining manpower, and the fixed price of gold made it uneconomical to mine the far reaches of Alaska. Iditarod and...
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other towns became ghost towns, and the trail became nearly a memory, only 50 years ago. Today, highway and railroad development and suburban Anchorage obscure some of the southern portions of the trail. However, many other sections are intact, passing through state and national parks and preserves, and through native lands. Rural villagers still use the trail for winter travel between towns, and for access to hunting and fishing. The Iditarod Trail Sled Dog Race was established in 1973 to commemorate the historic route and the dogs and men who helped shape Alaska's history, and to promote inclusion of the trail in the National Trails System Act of October 1968.

I

t was in 1968, too, that Jim Lanier decided to stay in Alaska. He and his wife, Ann Pellizzi Lanier, both received their M.D. degrees at Washington University School of Medicine in 1966. He was drafted for two years of service in the Public Health Service, and worked in Indian Service Hospitals. Ann Lanier, M.D., is currently conducting cancer research among native Alaskans, working for the Center for Disease Control, a branch of the Department of Health and Human Services. Lanier is Director of Laboratories at Providence Hospital in Anchorage, which, with 240 beds, is the largest, most comprehensive tertiary care hospital in the state. The Laniers have three children, daughters ages 11 and 12, and a son who is three. "About six years ago," Lanier explained, "I bought my kids a Siberian Husky puppy for Christmas. Then, I bought a few Alaskan Huskies, to pull a sled so the kids could ride." It's another version of the old story of Dad and The Kids' Toys — Lanier kept buying dogs and working them, talking to dog breeders and trainers and drivers. "Before I knew it, I was planning for The Big One." Mush ing became a full-fledged hobby for Lanier, whose few dogs soon became a bona fide kennel, albeit in a subdivision yard, with dogs and harnesses, sleds and special arctic clothing and camping equipment, and a special truck to haul it all to racing events. In 1980, the Laniers moved from their subdivision home to a place with more room — for the dogs.

Malamutes, Samoyeds, Siberian Huskies — all are AKC-recognized northern working breeds of varying sizes, and weighing approximately 40 to 70 pounds for Siberians, and over 100 pounds for Malamutes. Iditarod racers have been carefully breeding their own special purpose dog, known as an Iditarod dog, and Lanier owns several of them now. Sled dogs are trained to respond solely to vocal commands, such as "Hike!" to move out. "No one says 'Mush,' " Lanier said. The word is an Anglicized version of the French, "Marchez," which means to move on or to march. "Gee" and "Haw" are commands for right and left turns, and "Come Gee" or "Come Haw" mean to turn 180 degrees. "Line Out" commands the lead dog to align to the team in front of the sled.

For races, teams can vary from three to more than 20 dogs. The lead dog is in charge of the team and is usually the most intelligent, swift and well trained. Alaskans talk about lead dogs much as cowboys used to talk about cutting horses or teenagers today talk about cars. The swing dog or swing pair follow directly behind the leader. All other team dogs are hitched in pairs, back to the wheelers which are the pair directly in front of the sled. The tow line or gang line of the harness runs between the pairs from the sled to the lead dog, and tug lines connect the dogs' harnesses to the tow line. Iditarod mushers must drive at least five dogs. Some drive as many as 20, but 12 to 14 is the norm. The most popular harnesses are made by a woman in Kila, Montana — Mel Fishback who learned the art from native Alaskans. The traditional sleds are made of white oak and hickory or birch tied with rawhide. They weigh approximately 50 pounds, cost upwards of $500, and can accommodate two passengers or cargo for a day on the trail. The dog drivers, when not pushing the sled, stand on runners extending behind it. For the long-distance races, the sleds are loaded with food for man and beast, small cook stoves, tents and sleeping bags, booties for the team to be used if a dog gets sore paws, gear to secure the team for rest periods, snowshoes for the driver, and a fur hat equipped with a headlamp for night driving.

On the trail, a driver will usually eat "almost anything but not enough, and drink coffee until his teeth float," Lanier admits. Each dog in the team normally requires five pounds of food per day, a
A musher's view of moving on into the sunset. Note the tripod trail marker to the left of the lead dog.

mixture of lamb, beef liver, lean beef and a pound of commercial dry food. Many drivers feed beaver meat, which can be purchased from trappers. One veteran musher, Joe Reddington, has developed a concoction of beef, honey, oil, powdered eggs, brewer’s yeast, vitamins, mineral salts and wheat germ oil, which he forms into one-pound balls to give as a daily snack, in addition to regular rations. Lanier fed these “honey balls” to his team. Feeding a team during the race costs approximately $3,000; but feeding a driver costs only $200 or so.

Preparing for the Iditarod is a major undertaking for each competitor, for the race committee, for people in every little hamlet along the trail. Involvement with the Iditarod is so pervasive that it seems to be a way of life for hundreds of Alaskans. The Iditarod Trail Committee has been organizing the race since 1973 (and earlier, when it was a 28-mile race), establishing rules, coordinating fund-raising events in many towns, and conducting a statewide sweepstakes to raise the $100,000 purse which is shared by the first 20 mushers to cross the finish line.

The annual sweepstakes is indicative of the esprit generated by the race. A total of 1,049 tickets are printed and sold for $100 each. Prizes are donated by businesses throughout Alaska, and range from a new Piper Cub aircraft to 1,049 bottles of Ranier beer. The funds raised constitute the mushers’ prizes, and support race expenses such as veterinarians, ham radio communications, air support and trail maintenance.

It costs each musher nearly $10,000 to compete, not counting daily kennel operations throughout the year — thus the need for sponsors. Purveyors to the sportsmen and women are logical sponsors but not the only ones. Big business such as General Foods, Burger King, Chevron and Atlantic Richfield, Western Airlines and Flying Tiger Lines and the Alaska Railroad sponsor individual competitors. Associations sponsoring mushers include: Interior Trappers Association, Alaska Native Brotherhood, scouts and labor unions. Other sponsors listed in the annual magazine published in conjunction with the race range from entire towns to “mom and dad,” “my wife,” and several saloons. Towns and civic and social organizations throughout the state hold raffles and potlucks, dances and socials to support their sponsorship. The fund-raising events begin well in advance of the race, just as does the training for it.

In addition to physical conditioning, the drivers must plan their strategies and pack and ship their replenishment supplies to the checkpoints. They plan whether or not to sleep or linger at the checkpoints or to camp on the trail alone, where and when to sprint to save time, whether or not to travel alone or run primarily at night time. They need speed and skills in winter camping chores, dog care and handling, and orienteering. They need great psychological strength. Lanier had several friends who helped condition and train his team. He trained for six months, intensively for the last three. By race time, he had a total of 1,500 miles on his dogs, and nearly that much on himself. Lanier’s preparations also included spearheading the “Mushathon.”

The 1979 Iditarod corresponded with the opening of the Thermal Unit at Providence Hospital, a special unit to treat patients suffering from burns and frostbite. With some friends and co-workers at the hospital, Lanier developed the idea of the Mushathon. First-time Iditarod racers, and even many veterans, frequently have to “scratch,” or drop out — some even before the race begins. There are accidents along the way, or dog fights, or frostbite, or the overpowering weather and loneliness. Anyone who wanted to wager on rookie Lanier’s fortitude had to pledge some amount per mile — thus, the Mushathon. The International Association of Fire Fighters, people often exposed to the dangers of severe burns, challenged Lanier to endure the dangers of frostbite, putting up a dollar a mile to benefit the Thermal Unit. The idea caught on, supported by newspaper and television coverage, and soon pledges came in from all parts of the state. The Thermal Unit became a “cause celebre” of sorts, and Lanier became known as “The Mushing Doctor.” No one had to ask him: “What’s a nice guy like you doing in a race like this?”

The race is incredibly difficult and potentially dangerous, but it is far from foolhardy. There are 48 rules and regulations requiring stops at 25 checkpoints for veterinary examination of dogs, specifying the required gear and quantities of dog food, requiring one 24-hour layover, and even a rule requiring each musher to carry a symbolic cachet of mail from Anchorage to Nome. An airborne race marshall enforces the rules. Pilots fly over the trail, providing weather and location information to checkpoints and to commercial broadcasters which report the race. They are available to assist in emergency transportation. In each town along the way, people with snowmachines turn out to break the trail when needed, and everyone lines up along the route, greeting contestants as they arrive. Checkers at the checkpoints, usually homes in villages along the trail, provide hot food, a place to sleep, and shelter
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The 1978 race was a veritable and incredible dead heat; less than one second separated the first-place winner of $12,000 from the second-place winner of $8,000. The winner, Dick Mackey, completed the ordeal in 11 days, 18 hours, 52 minutes and 24 seconds. Rick Swenson, who won the 1979 race, had placed second by a second in '78. The Red Lantern time in the history of the race was for the dogs if a musher wishes. They also store supplies shipped in advance. Ham radio operators at each checkpoint maintain constant communication and relay the location of each musher in the race. Any musher 24 hours overdue at the next checkpoint is known, and townspeople with teams and snowmobiles, along with pilots, begin searching. All of this support is organized by the race committee which determines winners, too.

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On Saturday morning, February 24, 1979, a total of 55 teams assembled in Anchorage's Mulcahy Stadium. The field included a man whose uncle, then 81, had been one of the serum relay drivers who served for the late Leonard Seppala, a man whose skills and accomplishments are still admired. He is more remembered as the musher who completed the nearly impossible run in 1925 to deliver serum to combat the diphtheria plague in Nome. He had left Nome, intending to rest at Nulato and meet a relay musher carrying serum from the railhead. However, the relay drivers had made better time than anticipated, and Seppala encountered the carrier before he reached Nulato. He took the serum supplies, turned around without a rest, retraced his journey over the icy Norton Sound through a roaring gale at temperatures of minus 30 degrees. He carried the serum a total of 340 miles, faster than anyone before or since. In his personal characteristics and skills, he symbolizes the pioneer dog mushers and their heroic contributions to Alaska.

The spirit of Seppala was embodied in every Iditarod competitor waiting to start the 1979 race. They may have been more aware of him than of the large crowd cheering them on from the grandstands. Joe May of Trapper Creek was the first to start, leaving Chute Two promptly at 10:02 A.M. He was followed at two-minute intervals by 55 men and two women. By midnight, the five leading teams had reached the Susitna checkpoint and had 1,016 miles to go. The temperature was hospitable, only minus ten, but the wind was gusting to 35 knots. On Sunday, February 25, the two leaders had left Skwentna for Finger Lake and Rainy Pass Lodge, and the entire field had made it through Susitna. By Monday, February 26, 85 miles separated the top 20 leaders, and the rest of the pack was farther back. All 55 teams were still in the running on February 27, although more than usual were reporting problems with a canine virus or flu, subsequently diagnosed as parvo virus, a national pandemic in dogs.

By 10:30 at night on the last day of February, the first musher entered McGrath, passing large welcoming signs painted by school children and posted along the trail. “Hot Food Ahead,” “Welcome To McGrath,” and “Hot Showers Ahead” were welcome words for all competitors. They would be arriving at McGrath, as at other checkpoints, throughout the next several days, with townspeople on snowmobiles lined up to cheer them. McGrath is one of several communities which gives a trophy to the first musher in. At midnight on March 1, the first two teams left McGrath, 11 were still there, and 12 more were expected. The trail ahead, along the Bering Sea coast, was whipped by the north wind which dropped the wind-chill temperature down to minus 60 degrees and created a blinding whiteout. No one quit.

By March 2, the five leaders were near the halfway mark at Ophir, stalled by high winds. Eight more teams were only 20 miles behind the leaders. One team had to drop out because the dogs had sore paws. Jim Lanier was behind the middle group and had left Rohn River at one in the morning heading for Ophir, a few hours ahead of the red lantern team. Between Rohn River and Ophir were the Farewell, Nikolai and McGrath checkpoints, and the most torturous parts of the trail. The weather was bad. High winds whipped up snowdrifts and obscured trail markers. Lanier became lost for a time, and fought panic. He had never been on the trail and the markers were gone. His mind began playing tricks on him, he said. "I found out then, somewhere between Rainy Pass and McGrath, that I wasn't as tough as I thought I was. The trail was tougher than I thought it could be. I became convinced that anyone who had done this before had already lost his mind and sadistically wanted me to lose mine. Then, I was afraid that I was losing my mind as well as losing my way!"

But he found his mind, and he found the way from Farewell to Nikolai. There, he was greeted by news of a medical emergency, greeted by race officials who had been anxiously awaiting the arrival of "The Mushing Doctor." A few hundred miles ahead, through the ground blizzard, in
Lanier and his team on the Iditarod Trail.
the checkpoint town of Iditarod, Kathy Flemming (a new mother who, with her husband, Jim, and their children, constitute the entire population of the town) had been preparing stew in a pressure cooker, anticipating the arrival of the race leaders. The cooker exploded, with the lid smacking her in the face and the boiling liquid severely scalding her chest and arms. A public health nurse was en route and an airplane being sent to bring formula for the new baby she could no longer nurse, and to get her to Providence Hospital's new Thermal Unit. The weather interfered with the nurse, the plane and radio communications over any distance. But the radio link between Nikolai and Iditarod worked. Lanier guided Jim Flemming in emergency first-aid treatment for Kathy. "My mind was numb, but I tried to help," Lanier said.

None of the racers reached Iditarod until the next day, when 14 teams came to town under clear skies and through high winds. The temperature was minus 20. Three other teams had reached Ophir, 17 hours behind the leaders. Kathy Flemming had been taken to the Providence Hospital and treated in the Thermal Unit for which Lanier was mushing. Jim was in charge of his home, family and race responsibilities.

By March 4, there were six leaders at Sahgeluk on the Innoko River, 529 miles from Nome. Seventeen had left Iditarod, and Lanier was in McGrath with five others. On March 5, one contestant quit at McGrath, with ten of his 15 dogs ill from a virus. Another contestant quit at Ophir. On March 6, the leaders were at Eagle Island, and all 52 remaining in the race were reported as struggling along. On March 8, the three leading teams entered the

"Who in season labors best, His labors ended, has the sweetest rest." — Philoctetes
The race was decided at 7:37 in the morning of March 11 when Rick Swenson mushed his 9-dog team down Front Street in Nome, in front of 1,500 spectators lined up to watch the climax of Iditarod '79. Mel Fishback, harness maker, was there. It was her first time to see the race. Swenson drove across the finish line and embraced the monument at trail's end. He was a full 42 minutes ahead of the second-place team. The frontrunning groups entered Nome throughout that day and others through the next week. They found the Iditarod Winter Carnival going strong. There were snowmachine races, a basketball tournament, balls and banquets, and the awards ceremony later on. Food and drink. Friends. Warmth.

Also on March 11 there were disconcerting reports of brutal weather between Eiel and Nome, with visibility cut to 15 feet by wind and snow. One driver was reported 24 hours overdue at Koyuk. Another had staked his team and settled in to wait out the storm. He became lost from his team and wandered about the area trying to find them. Three more teams dropped out at Shaktolok, Unalakleet and Eagle Island as the weather raged. There were 37 still on the trail. Jim Lanier was one of them.

He mushed on until March 19, crossing the finish line 24 days, six hours, 44 minutes and 18 seconds after leaving the starting chute at Mulcahy Stadium on the other side of the state. Fifty five started. Forty seven finished. "The Iditarod nearly was a shattering experience. It dwarfs other races and any other 'fun.'" Lanier said.

He describes the experience. "Every 50 miles on so, there is a checkpoint, so we try to average 50 miles a day, at a cruising speed of around 8 miles per hour. Hour after hour after hour. We are in total wilderness. The winds can obliterate the trail. Even veterans can get lost. People have been lost out there for days! I usually ran at night, sometimes through near blizzard conditions. Between Farewell and McGrath, the wind was up to 35 knots and the temperature was minus 25. We use a hat with a lamp on it at night, although sometimes there is enough moonlight. During the race, you sleep a total of two to four hours a day. You spend a lot of time checking equipment, repairing it, tending to the dogs' feet, putting on booties if they get sore. I wore special insulated boots, layers and layers of clothing and a big arctic parka. The stress is unbelievable! There is all of the sleep deprivation. You get tired, incredibly lonesome, and depressed. I would fall asleep on the sled, and fall off. Going over the mountains, I got lost. All sorts of things happen to your mind."

Mushers have reported seeing, for example, people waving to them, or gravestones or forests, or a cabin with smoke coming from a chimney. When they head for the cabin and its comforts, it disappears. Lanier did not hallucinate. "But," he said, "I had paranoid delusions that people had talked me into this because they wanted to see me fail. Maybe they even wanted me to die out there in the wilderness. The most difficult challenge was mental."

To meet the mental challenge, Lanier relied heavily on the pledges to the Mushathon. He almost quit at 400 miles, but the Mushathon and the response of the people inspired him onward. "I just couldn't see scratching at McGrath and asking people to pay 400/1049ths of their dime-per-mile, or dollar-per-mile," he said. Blood and urine samples were taken during the course of the race as part of an on-going research project examining psychological and physiological stress under Iditarod circumstances. For the last 900 miles, he traveled with four other teams, helping and teaching, sharing the good and the bad, doctoring himself and another driver who had stomach flu, and sewing the scrotum back on one of his dogs who had been in a fight. It was a great adventure.

He didn't run in the 1980 Iditarod. He took his wife to Hawaii, instead. He has some work to do on his kennel at their new place, too, he said. Will he ever run in another Iditarod? "I think I'd like to, although if the question had come up soon after the first one, I'd have said no." Will he have another Mushathon? "I needed that for inspiration, for something to focus my determination on. But I doubt that my friends and colleagues here in Anchorage would support another one." What about a Mushathon for the Medical School? "I'd go for it! I'd go for it!"

And so, in March 1982 or 1983, Jim Lanier, M.D. '66, hopes to mush again and for another cause. Some people just won't quit.
An Appreciation of Viktor Hamburger

Portrait of the scientist as a young man in 1933.
In 1976 Viktor Hamburger, professor emeritus, Zoology, Washington University, was presented the 4th annual F.O. Schmitt Prize in recognition of his contributions to developmental neurobiology. The award was made with the following citation:

“Most widely recognized for his definitive studies of the development of the chick spinal cord and of the spinal and trigeminal ganglia, he has also made basic contributions to developmental genetics, to experimental teratology, to the initial discovery of the nerve growth factor, and, in recent years, to the ontogeny of behavior. His career has spanned the entire era of modern experimental embryology. (His) pioneering achievements have increased our knowledge and understanding of the development of the vertebrate nervous system and mark him as a distinguished leader in developmental neurobiology.”

Citations alone can capture only a very small portion of Viktor Hamburger’s scientific and personal contributions. For 50 years he has had a significant impact on the field of developmental neurobiology. From his first publication in 1925, as a student in Germany, to his most recent, published in Jan., 1981, he has either been directly associated with or has indirectly influenced almost every major development. Perhaps Dr. W. Maxwell Cowan, past chairman of the Department of Anatomy and Neurobiology, sums up Viktor’s work best in his introduction to Viktor Hamburger’s Contribution to Developmental Neurobiology: An Appreciation: “It is given to relatively few to be so totally identified with any scientific endeavor.”

His favorite years spanned the two decades between the world wars, the period which has been termed the ‘classical era’ in developmental neurobiology. (Classical usually refers to a period of major achievement in a branch of science or other human endeavor, a period in which a field has reached maturity, characterized by simplicity and proportion, and has gained considerable impact on ways of thinking or artistic expression.) This classical period evolved into the 1950s, a decade that, with the unravelling of the DNA genetic code and the discovery of ‘nerve growth factor’ (NGF), ushered in a new period in the growth of developmental neurobiology.

During his career, he has published more than 100 articles—a major accomplishment in a field that does not readily lend itself to rapid publication. (Publishable results may require as much as 2 years to acquire.) His Manual of Experimental Embryology, originally published in 1942, remains a classic in the field of experimental embryology. Throughout his career he has carried a full teaching load in addition to spending a decade of summers as an instructor and later director of the embryology course at the Woods Hole, Mass., marine biology lab.

During the Fall I met with Dr. Hamburger in his office in the Monsanto Building for a series of interviews. We talked about his personal life as well as his public, academic life. What emerged was the warm, self-effacing private man behind a gifted scientist.

In 1927, Viktor, a recent Ph.D. recipient, published an article in the journal “Naturwissenschaften” (“Natural Sciences”) that outlined a long-range program of scientific research in development in developmental neurobiology, identifying the three major issues in this field:

1. To what extent is the developing nervous system responsible for the development of organs which receive innervation, as for instance, the developing limbs?
2. Do the peripheral structures, such as limbs, in turn influence the differentiation of their nerve centers?
3. How are peripheral nerve pathways and the highly specific connections of nerve fibers with their end organs established?

Later, a fourth issue was added: What is the relationship of neurogenesis to the development of behavior?

This then, with a few minor side excursions added, was the plan of a scientific career. This particular style of patient and consistent pursuit was well suited to Viktor’s personality. He explains: “Following a charted course rather systematically without straying too far afield, concentrating on a few major themes rather than expanding over a wide range, suited my temperament.”

Viktor traces his inclination toward developmental biology back to his boyhood years around Landeshut, in Silesia, Poland, now a part of Germany: “I started very early in getting frog eggs and salamander eggs into the house, into my own aquarium and watched them.” He maintains that there must be a scientific streak in his family, for “quite a few members were either professional or amateur biologists.”

Following WWI (Viktor served as a German soldier for the final six months and participated in the ‘revolution’ that spawned the short-lived Weimar Republic) he spent two semesters at Heidelberg University studying zoology and embryology. However, instead of remaining at Heidelberg, he chose to work on his Ph.D. at the University of Freiburg. His entrance into Freiburg was facilitated by his aunt, Dr. Clara Hamburger, a research assistant in the Zoological Institute at Heidelberg. At her suggestion, he applied to work in Hans Spemann’s laboratory, and was immediately exposed to the most exciting work in developmental biology of that period. This work progressed toward an exciting climax with the discovery of the ‘organizer’ (the complex embryonic inductor which determines the formation of the axial organs including the nervous system.)

Viktor, however, watched the ‘organizer’ work only from the sidelines. He was assigned a thesis problem in the experimental analysis of the nervous system, specifically, an exploration of the role of innervation on the development of the limbs in amphibians. As a result, he comments, “I remained addicted to the developing nervous system through most of my scientific career.”

Viktor’s work on limb innervation brought him into the orbit of the leading American developmental neuro-biologist of that time, R.G. Harrison, who was also intensely involved with experiments on the developing limb. Harrison, a friend and colleague of Spemann, would spend some of his summers at Freiburg, and Viktor consulted him freely. Of these encounters he later wrote: “I consider myself as much a student of Harrison as of Spemann. To have two such mentors of such a stature is a rare gift for a budding scientist.” Today, three portraits, one of Spemann, one of Harrison, and a third of F.R. Lillie, who brought Viktor to Chicago, hang on his office wall.

From Spemann the teacher, Viktor credits having learned the "art of good experimental design, the way of asking sensible questions of the developing embryo which might elicit meaningful answers.” Hando-
in-hand went the essence of experimental embryology: “The causal-analytical approach to embryonic processes, where one asks, ‘Which factors or agents are responsible for the formation of a particular structure, at a particular position in embryo, and at a particular stage of development?’ “ A third legacy was “the primacy of the problem, the ‘Fragestellung,’ the intellectual adventure, rather than the tools.”

He received his Ph.D. in 1924 and after several postdoctoral years, he returned to Freiburg in the capacity of ‘Privatdozent,’ a member of the faculty with lecturing privileges but without an official rank and with no salary other than a portion of the tuition the university received from his handful of students. His father, the owner of a textile mill, helped him financially during this period.

During his postdoctoral years, Viktor worked as research associate in Otto Mangold’s laboratory at the Kaiser Wilhelm Institute for Biology in Berlin. Here, Viktor made his first major contribution to developmental neurobiology. By microsurgically removing that part of the spinal cord which supplies the limb nerves, thereby depriving the developing limb of all its innervation, but without any resulting anomalies, he showed that limb innervation is not essential for limb differentiation and development. These early experiments established the developmental independance of the various tissues that comprise the limb, from the nervous system.

In 1932 Viktor received a one-year Rockefeller Fellowship to work in F.R. Lillie’s lab at the University of Chicago, the stronghold of chick embryology, for the specific purpose of applying the microsurgical techniques of Spemann to the chick embryo. Of this period, he says, “I think that one of the most useful contributions which I have made resulted form this project.” Up to this time the only analytical technique commonly used on chick embryos was the transplantation of tissues or organs onto the chorioallantoic membrane, which is wrapped around the embryo. A major drawback of this technique was that in long-term studies these transplants would become grossly distorted. Using the microsurgery techniques learned at Freiburg, Viktor showed that the chick embryo was ideally suited for experiments in developmental neurobiology, preferable to amphibians, because of its greater affinity in structural organization to mammals. Viktor’s utilization of the chick embryo through the years has helped put the chick embryo ‘on the map,’ so to speak. Recognition came when, in 1977, his and a colleague’s ‘stage series’ of chick embryos (published in 1951) was named by the Institute of Scientific Information (ISI) a ‘citation classic,’ the second most cited scientific paper during the period 1961 through 1975.

When he first arrived in Chicago in 1932, Viktor had no desire to remain in the U.S. after his one-year fellowship expired. Political events in Germany, however, soon changed his plans entirely. The rise to power of the Nazi party under Adolf Hitler in early 1933 and the hatred sparked by anti-semitism were to have a momentous effect on his life and career. In early 1933 he received a letter from the Dean of Faculty at Freiburg informing him that, due to the new laws calling for “the cleansing of the professions,” he was being dismissed from his faculty position. Earlier that year Spemann had written, urging him to stay in the U.S. and find a position. Following the war, Viktor was officially reinstated as professor at the University of Freiburg and now holds the position of Professor Emeritus at that institution.

His transition to a career in U.S. academics went smoothly. Already possessing a U.S. fellowship, he was placed atop the list of ‘displaced scholars’ to be supported by the Rockefeller Foundation, and his fellowship was extended for another two years. He remembers: “So I was perhaps one of those fortunate refugees whose transition was really greatly facilitated and who went through no hardship, whereas others had very hard times for a few years, adjusting themselves, and doing all kinds of menial jobs just to support themselves. And at that time, the type of work which I did was much more appreciated in this country than in Germany.” In 1940 Viktor became a U.S. citizen.

By 1935 three positions became available to Viktor. Considering the Ukraine and Sao Paulo, Brazil, too dangerous especially for his young family, he wisely chose Washington University and the position of Assistant Professor in Zoology. Of his first impressions, he comments: “It was a very provincial place. It was a so-called ‘streetcar university’ in 1935. About 75 to 80 percent of the students were local boys and a few girls. And the faculty, except for the Medical School, was not of a national reputation. And as a young man, I was the tip of the tail end.” He was promoted to Associate Professor in 1939 and he became a U.S. Citizen in 1940. The next year he was a full Professor and he remained at Washington University for the rest of his career, serving as chairman of the Biology Department from 1941 to 1966, when he was appointed Mallinckrodt Distinguished Service Professor. In 1969 he became Professor Emeritus of Biology.

Viktor’s first few years as chairman were an extremely satisfying period: “I had the very good luck of finding and appointing four or five first-rate people, all of whom did extremely well in research. So I had my own self-chosen family.” Under his guidance the Department also began hiring more women to fill research and teaching positions. Dr. Florence Moog, professor of Zoology and long-time friend of Viktor, remembers: “There are an extraordinary number of women in the Biology Department. I think that can be traced back ultimately to Viktor Hamburger who was willing to hire women as members of the faculty. This was back in the days when it was not very well thought of. He laid a foundation that the Department has built on very profitably.”

During the late 1930s and through most of the 1940s, Viktor’s research was primarily a continuation of the foundation he had laid down while at Chicago: using the chick embryo to follow his 1927 objectives on limb innervation. However, through a strange set of circumstances, his work was to become intertwined with that of an Italian researcher, and together they would have a profound impact on the future course of neuroembryology.

After the war Viktor, quite by accident, stumbled across a group of papers by Rita Levi-Montalcini and Giuseppe Levi, which had been published during the war in two rather obscure European journals. They had repeated his 1934 experiments concerning the effects of early limb removal on the development of the spinal cord and on the related sensory ganglia, but had interpreted similar results differently. In 1947, with characteristic forthrightness, Viktor contacted Dr. LeviMontalcini, persuaded her to come to St. Louis and resolve their differences in his laboratory. He obtained the necessary monetary support...
from the Rockefeller Foundation. So began one of the longest and most fruitful collaborations in neuroembryology. Viktor recalls that "the year [1947] ended amidst many new projects for the coming years, with no thought of ending our fellowship which is still very much alive after 30 years. We did accomplish what we had set out to do, but little did we know at that time that within a few years an entirely unforeseen vista would open up."

The 'unforeseen vista' was the discovery, in Viktor's lab, in the early 1950s, of 'nerve growth factor' (NGF), and was the result of one of those lucky accidents that seem to favor the prepared and persistent researcher. Their mutual research into the interaction of the peripheral tissue, the limbs, on the developing nervous system was proceeding with remarkable success. (In fact, their first collaborative study, titled "Proliferation, differentiation and degeneration in the spinal ganglion of the chick embryo under normal and experimental conditions," published in 1949, is now widely recognized as one of the classics in the field of neuroembryology.) They noticed that when rapidly growing embryonic limbs were transplanted near the appropriate portion of the developing nervous system, the nerves were enlarged beyond their normal size. In the direct course of further experimentation they decided to see if other rapidly growing tissue would exert a similar effect. A mouse tumor, a sarcoma, was chosen. Of these results Viktor later wrote: "The results were very impressive, but at that time, they did not seem to be different from results gained in the previous experiments using embryonic limbs." [But] at this point, the unexpected happened. A careful scrutiny of the material led Rita to the discovery of a very strange and unusual feature: that nerve cell aggregates located at considerable distance from the tumor were also greatly enlarged. We were now confronted with a new phenomenon which no longer seemed to fit our old ideas. The most plausible hypothesis was that the tumor had produced a chemical agent which had reached the remote ganglia by diffusion — a bizarre phenomenon which could not have been anticipated or predicted by the most imaginative speculation." At this point Viktor graciously stood aside — he felt he could not contribute to the biochemical identification of NGF — and turned his attention to other problems.

Later work with NGF found the growth factor to be present in more potent form in snake venom, and to a much greater potency still in the salivary glands of adult male mice; salivary gland NGF, in fact, is 40,000 times as potent as that found in the original sarcoma tumor. The further exploration into NGF is currently being conducted in major laboratories in the U.S. and abroad. Without NGF, which is an absolute requirement for the survival of sensory and sympathetic ganglia, research into various nervous system diseases, such as some phases of multiple sclerosis research, could not have begun.

During the early 1960s, Viktor became seriously interested in the problems of the ontogeny of behavior. He was taking the next logical step in understanding the complex physiological makeup of the nervous system. He says, "After a lifelong preoccupation with the mechanisms of structural neurogenesis, I began a comprehensive study of the functional and behavioral manifestations of the nervous system." What had helped pique his interest was an 1885 book by the German physiologist and psychologist, W. Preyer, who had laid the foundations for a scientific approach to development of behavior.
Great progress had originally been made in the first few decades of the century, but due to a theoretical impasse, the entire field had been dormant since the 1940s, and no new approaches had been attempted. Viktor felt that "this whole area was ready for a revival."

In science an old idea, theory or observation may lay dormant seeking acceptance and continuation by a willing mind. This was the interaction between Viktor and Preyer’s 75-year-old book. Says Viktor, "The intimate correlation of the stepwise advances in behavior development and the structural differentiation of the nervous system and its circuitry, achieved with the highest standards of excellence, could not fail to make a deep impression on the neuroembryologist. One of Preyer’s findings directed my own thoughts along entirely unconventional paths." This incursion into a new field was, as was most of his career, planned. "Planned," he says, "in the hope that the application of the techniques of microsurgery might open up new approaches and thus break the theoretical deadlock." Viktor did not attack the problem with an unprepared mind. Applying experimental methods to test his confirmation of Preyer’s observation, he firmly established a basic foundation that embryonic motility is a product of autonomously-generated nerve tissue activity and is totally independent of external stimuli. This hypothesis met with considerable skepticism and antagonism at first. But in the intervening years new experimental evidence both broadened and strengthened the original foundation.

In 1969 Viktor retired as professor emeritus. Retired, it must be added, in name only. He continues to direct research, his own, as well as that of post-doctoral students. During the past decade he has authored more than 20 articles and book chapters and still seeks answers to the ever-expanding questions raised by his research. He has no intentions of going "out to pasture" or "to seed." Curiosity is still the major influence in his career.

Quiet and retiring by nature, Viktor has not purposely sought the limelight. He is, in his own words, "averse to publicity and controversy." Yet, and appropriately so, he has not been without honor and recognition. In 1950, and again in 1951, he served as President of the Society for Growth and Development (now The Society for Developmental Biology); in 1953 he was elected to the National Academy of Sciences; in 1955 he was elected to the presidency of the American Society of Zoologists; in 1959 he was elected to the American Academy of Arts and Sciences; in 1960 he served as Vice President and Chairman of the Zoology Division of the American Association for the Advancement of Science (AAAS). In 1979 he was the recipient of the Wakeman Award for his work in the field of Neuroscience.

On July 9 of this year Viktor will celebrate his 81st birthday. Throughout his long life he has influenced his many friends, colleagues and students. Many of his students have gone on to promising research careers of their own. He is loved and respected by his friends — a respect that is built from personal, day-to-day association. Fairness is a strong character trait, as Dr. Florence Moog remembers: "Viktor treated me in the same way that he treated anyone else in the department. I never felt I was discriminated against in any sense. I never received a smaller salary than men who came at the same time. I was never asked to do more teaching or more work. Viktor treated me in a perfectly fair way. But then there is nothing exceptional about that — because there isn’t anybody who couldn’t say the same thing."

Concurrent with his academic career, Viktor maintains a wide variety of outside interests. He is extremely well read with a deep and wide knowledge of literature and art and, in the opinion of more than a few, could establish himself as a successful art critic. His international reputation has given him the ability to travel widely — an activity he still enjoys. He has always enjoyed nature and what it can teach.

Perhaps his greatest contribution has been his love of life, of things living, and of people. From his wide circle of friends and colleagues, he "continue[s] to learn and grow." Tom Hall, Viktor’s friend for 30 years, says it best: "With Viktor, one cannot simply have an affair of the mind, it ultimately becomes an affair of the heart."
Hamburger received an honorary degree from Washington University Chancellor William Danforth in 1976.
A Team That Cares for Cancer Patients

Catherine Williams, a slender woman wearing a jaunty beret and a lively dress of many colors, arrived a few minutes early for her weekly appointment on the second floor of the Wohl Clinic Building. Cecilia Smelcer, the secretary, was thumbing through a line of thick files and talking to a patient on the phone. She paused to smile, "Hello, Catherine," she greeted Catherine by name. Catherine found a chair in the waiting room and began crocheting, not missing a stitch when social worker Maureen Magrath stopped to chat for a few minutes, on her way through the waiting room.

"I had my surgery," Catherine Williams said. "And then I met you while I was in the hospital. You told me to start thinking because I was so upset and I didn't know what to do. You told me to put down everything that would come to me in my mind. To write it all down and let you know about it. I did that. I asked you, 'Do you think the cancer was still in my body?'" Catherine Williams reflected on the past few years—her years as a cancer patient, sharing the times with Wallack and talking to him as she would to a close friend.

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The team approach to cancer care requires specialists from many disciplines—nurse oncologists, physicians, administrators, dieticians, social workers and pastors. The concept is relatively new and was advanced in the Department of Surgery approximately five years ago when Marc Wallack, M.D., came here to develop the team caring concept. "The roots were here at the time," he said, "but I wanted to develop the group to include a social worker, chaplain, and a dietician at least part time." Wallack has been a surgical resident and cancer fellow at the University of Pennsylvania. "From my experience seeing cancer patients treated," Wallack explained, "I felt that the greatest need was not for excellent medical treatment, but also for helping patients develop the ability to cope, to live, to think and to talk. Patients need to be able to discuss their diagnosis, face facts, understand what treatment is needed and why, and feel welcome to discuss their disease with the people who would be treating them."

An important aspect in the team approach is involving a member of the patients' families in the care. Treatment is usually given on an outpatient basis, and when patients come to "clinical day," several team members will spend time asking questions, chatting and listening. Team members and family members are crucial in helping the patient get his or her life back on track. Family members usually require...
practical advice and emotional support so they can care for the patient at home and begin solving the varied emotional, social and practical problems arising when cancer strikes a family. When a patient comes into the team program, he or she will find a different kind of attitude, almost an extended family. The nurses, physicians, chaplain and social worker make it a point to know the people and their feelings, fears, faith and hope. Or the lack of it. "Having a group of people enables patients and their family members to establish a good relationship with at least one of us," Wallack said. Cecilia Smelcer and Diane England, the secretaries, were recruited for the group because of their administrative experience and, more important, their background in interaction with patients in the Department of Psychiatry. "They know each of our patients," Wallack says, "and can relate very well, talk to them, screen problems on the phone and quickly get the right person to provide further help to the patient. We couldn't do half of what we do now if it weren't for Ceil and Jane."

According to Wallack, "It is important for the patient and the family member to have a solid idea of what it means to have cancer so they can develop, eventually, to be able to talk about it, to deal with it. Patients can reach that stage more quickly with help from a group like this. There are more and different people to listen and help. And having a team allows for closer, more attentive follow-up because many people are responsible. Cancer patients and their families require intensive love, understanding and guidance so they can resume thinking and take control of their lives."
Involving the patient plus a family member or special friend, and giving them information and opportunity to participate in decisions about their treatment helps people comply with that treatment and live fully. Establishing trust as the basis for honest communication is the responsibility of everyone on the team. “Every person has something different to offer,” says Caroline Sant, “None of us has the same style or approach, or the same strengths and weaknesses.” Adds pastor Maureen Magrath, “There is no clear-cut, inviolate territory. By careful selection of staff, the overlap is dynamic and focused on the total personhood of the patient. It works, and it shows in the reactions and responses of the people in the program. Having a chaplain on the team brings in a new discipline as a resource for the patients. I am here to be another caring person as well as a buffer, a non-medical person who is a member of the team, who knows the system of resources available to help patients. I am also liaison with the home parishes and ministers, and work with the patients’ families, helping them get through the crisis and helping them relate better to the doctor and nurses.”

Magrath describes her main responsibility as counseling patients and families in coping with a diagnosis or with the progression of the disease. “There are no universal reactions, no predictable stages of human response to a diagnosis of cancer. There are no neat categories,” she says. “Each patient is an individual.”

Magrath begins her work with new patients by talking about past crises in their lives — job losses, divorce, sickness and death in the family, or other significant changes or losses. “It is important to know how each patient and the family has dealt with previous crises, and how they felt and responded over time. Having cancer is not the first crisis for most of us, and it probably won’t be the last. Helping a patient realize that they coped and had inner strength is very important,” Sant adds. “Within a very short time, most of our patients are coping very well. We have a few who have an extremely difficult time, and we go to the resources of the Medical School and the community to get help.” According to Magrath, “Most people are overwhelmed and very nervous when they first come into the program. Many are terrified because of misinformation about cancer. One man told me about being afraid to hug his grandson because he believed that the child could get cancer from him. He was so convinced and so frustrated that he could barely talk about it. We must identify all of this wrong information and educate the patients and their family members about the nature of the disease and the help that is available.”

“O ur orientation,” adds Sant, “is to give the patient maximum control over his or her life and schedule. Having control and autonomy enables any patient to make the best use of time, even if there is little time left. They can accomplish what they want and live a satisfying life.”

While a diagnosis of cancer does not automatically mean imminent death for an individual, cancer is the principal cause of death in the United States. The members of the Surgical Oncology Section team care mainly for patients with cancers of the breast, colon, stomach, pancreas, liver and lung, plus patients with melanoma and sarcoma. There are frequent improvements, and remissions following surgery and adjuvant radiation and chemotherapy. Yet, it is a fact of life that more than half of the team’s patients will experience recurrence, metastasis and death. “Getting to know our patients as we do, following their progress and watching, in many cases, remissions and death, is the most difficult thing that we face in the job,” Wallack said.

“There are not a lot of people in the world who can do this kind of job.” Adds Diane England, “This group is very close, even after hours. We get together in each others’ homes to celebrate birthdays and holidays, or just have a barbecue.” The demands of their vocations pull them together to meet challenges and to rejoice, unwind and have fun.

In preparation for Clinic Day, which is every Tuesday, the group gets together on Monday afternoons for chart reading and sharing of other information and reactions. Up to 15 patients are usually scheduled to be examined by Wallack, and 35 or more will receive chemotherapy from the nurse oncologists. Two groups of charts stand in racks for the Monday chart-review session. Present in the small conference room are oncology nurses Peggy Nelson, Gail Farley, Francine Woelfle, Micki Sullivan, Diane Bohner and Mary Griffin, social worker Maureen Magrath, pastor Caroline Sant, and secretary Ceil Smelcer. Wallack is expected to be a few minutes late, having been in surgery. When he hurries in, he greets this assemblage of women with a smile and the salutation: “OK, You Guys, let’s get to work.”

“The Guys” at work are impressive, fully informed of each patient’s physical and emotional status and family situation. Their knowledge is freely shared and the discussion during chart reading indicates their affection for the patients and family members, and their love and respect for each other. At chart reading, when one team member reaches a decision, she shares her reasoning with them all and asks for reactions and information, opinions and comments. No one is shy.

Chart-reading sessions drive home the point that disease is never just a medical problem: one patient is rearing young grandchildren for her own emotionally ill daughter; another patient has quitted an alcoholism rehabilitation program; another patient and his wife have finally been able to reach an important decision about a leg bag and there is joy throughout the chart-reading room. Several of the team members have information and concern about the man caught up in the red tape of early retirement and Social Security; another who wants to refuse all treatment until he knows exactly what his insurance will cover; and the couple who had depleted all their reserves paying for treatment and had been trying for months to sell their home to pay for more. Until the house was sold, there could be no financial aid for them. The real estate market is tough.

Times are tough. Each of the nurses remembers a slightly similar situation, and new options and sources of aid are mentioned. They will try to find help, somewhere. The social worker thanks them for adding to her knowledge of potential sources of funds. Plans are made to help the patient who must care for an elderly parent and endure the criticism of his brothers and sisters.

For every dimension of humanity there is a problem in addition to disease, and a loving, human solution proposed by the
Nurse oncologists Francine Woelfle and Mary Griffin confer about a patient's chart.

Caroline Sant provides pastoral care.
Micki Sullivan, nurse oncologist

Cecilia Smelcer, secretary

team. The team members identify who among them can best meet the needs of each patient, and they plan how to do so. It works. As one patient told them, “I feel like a real person, not just a case number.”

The crowded chart-reading conference room grows quiet when a report is characterized as “grim,” and a family is seeking hospice care because the patient wants it. Magrath will help in the search. The team members all want to be kept informed so they can visit their patient and friend. A young family man has died. Wallack was with him and his family for a long time. He praises the team, the family and the hospital staff. Then, there are reports about the clinical research protocols and new patients who could be treated on them. More information, more opinions and comments come evenly from throughout the room.

“We all depend a great deal on each other,” Wallack says. “I regard these nurse oncologists as colleagues. They can question me, and I rely on them for that. Nurses aren’t usually trained to do that. These are unusual nurses. I want honest communication from my team and from my patients.”

Honest communication is one of the key elements to the team approach. Wallack says, “A number of nurses see each patient so he or she can become familiar with them all. This makes for a better chance of finding one special nurse, or the pastor or the social worker, that the patient can relate to very well, very freely. It is important for the patients not to be afraid of the doctor because if they are afraid, they’ll forget all the questions they wanted to ask. With this approach, even if they forget to ask me, they will usually already have asked one of the nurses. She will know what is on the patient’s mind. When we’re in the room after the examination, the nurse can bring up the questions, or remind the patient or the family member who is always present at the consultations. We try to be open in talking about cancer, about having it and treating it. We’re not doing much that is radically different here than other major medical centers. The degree of involvement of the patient, the family member, and each one of us is the major point.”

Honest communication leads to the trust that a patient must have in the physician and nurses. Often, it does not come easily. “At first, I thought you were all lying to me,” said Betty Geritz. “I don’t know why I thought you would lie, but I sure felt that you were. I just had that feeling. I remember lying there in that hospital bed and seeing that lady in the next bed getting so much better treatment than I was getting. It was after the mastectomy. Then, you took over,” she recollects in conversation with Wallack. “You told me that I had to talk to you. But you have never been scary. There was something there and you took care of it. I talked to you about chemotherapy, and about not wanting to take radiation. But I went through the whole thing like you said. I’ve had some bad side-effects. I don’t like the looks of it. Not at all! But it is not going to put me down or anything like that.” Geritz has been on a national clinical research protocol of tamoxifen and radiation therapy since April 1979. She is approaching three years with no recurrence. Her husband comes with her and is included in all discussions with the team.

Everyone with a family member or a significant other person complies with the requirement for
Diane Bohner, nurse oncologist

joint attendance at consultations, although some do so more readily than others. "I don't like for him to know everything," one patient said. "He blabs and I don't like him talking about my personal self." Observant and sensitive, the team members had picked up some information about the husband's health and encouraged him to see a physician. The couple was then given advice and guidance on planning their daily lives to accommodate each other's abilities and limitations. "We've been through a lot lately, and we are still together," the husband tells Wallack. "I talked to my doctor about my outlook and he says not to worry. I have a lot of trust in you. Both of us do. And we thank you. All of you." All tests indicate that his wife is cancer free and can end chemotherapy in the spring.

Team care on an out-patient basis is proving its merits on many fronts. "Cancer patients do better," Gordon Philpott said, "with medical, surgical and radiation oncologists involved in some degree in the planning and providing of care and management. Outpatient, ambulatory, care with complete support services all working together can prevent what so often happens - the patient getting bounced around from one specialist to another."

Added Wallack: "Once the patient is given the diagnosis of cancer, there is a need for the patient and family to interact with others, to deal with the label, work through the diagnosis and understand the therapy that will be given."

Team care is costly, and out-patient care is cost-effective. However, charges to the patients generate approximately only 20 percent of the budget for the team. Part of the costs for salaries are paid by grants from the major cancer study organizations to which Washington University provides clinical research data. Funds are also provided by the medical school's Department of Surgery, Barnes Hospital and the Jewish Hospital of St. Louis. The social worker and chaplain who work with Wallack are employed by Barnes Hospital. Philpott is able to draw on support services of Jewish Hospital. Despite multiple sources of financial support, the team care concept requires increased funding to meet increasing demands and to expand its ability to serve.

Philpott and Wallack emphasized that the outpatient cancer-care program at the Medical School is similar to programs available through other major medical centers and schools. "We don't have a corner on the market," Philpott said. "We're not miracle workers."

At least one patient would disagree. "Marc, Dr. Wallack, he did a miracle, I know," said Stella Martinez. "They have been so good. You should see what they can do!" Martinez is a 30-plus-year employee of a railroad. Widowed, she raised three daughters alone and advanced from working cleaning passenger cars to becoming a mechanic's helper, taking apart generators, compressors and alternators and cleaning them. "I was just supposed to clean them with tetrachloride and put them back together, but I always wanted to see what made them work. My foremen were always good to me, and I learned much from them." Martinez became ill while living in Los Angeles and working for the railroad. A hospital in Los Angeles failed to diagnose her cancer. "I was sick for a long time and they could not find why. Nobody knew what was the matter with me. Then I moved to Arizona to retire. And I met a doctor who was there to retire. But he examined me and he said: 'Mrs. Martinez, you have a cancer.' He also said I did not have to worry because he knew a wonderful surgeon. I asked him if he would have this surgeon for his very own children if they were sick, and he told me 'yes.' So we come up here, and that is how I met Marc. He put me in this hospital right away and he said that I was very bad off."

Stella Martinez had cancer in both breasts, with extensive bone involvement and related problems, all undetected by prior tests on the West Coast. "I had been going for more than a year to the hospital which could not do anything. When I came here, I was so far gone! I stayed 45 days in this hospital here and did not care anything if I live or if I die. Dr. Wallack came in every day to visit me. And these nurses, all of them, they came to visit me. They all talked to me and made me get up and move. I cannot express to you all the things they would do for me. Everything that they can do for me, they do it! They know all the best things, and they do it for me. I give thanks to God for them and for everything. Even if I have suffered, there is no comparison with how good God has been to me. I have had a good life. I have a good life now. I have family and friends. And I have these people to take care of me."
Research Update:
Substance Abuse

The Washington University Drug Abuse Research Center has received a $1.2 million, five-year grant from the National Institute on Drug Abuse (NIDA). One of the first drug abuse research centers in the country, the Washington University center was initially funded in 1972 for a five-year period. A three-year grant renewal in 1977 enabled the researchers to continue their investigations into the basic biological effects of narcotics on the brain. The most recent renewal of the grant will allow the center to continue its activities through 1985. Theodore J. Cicero, Ph.D., Professor of Neuropsychopharmacology in Psychiatry (with a joint appointment in Anatomy and Neurobiology) is Program Director of the center.

In its earliest years, the Drug Abuse Research Center researchers took a broad look at the effect of narcotic drugs on the neurochemical and ultrastructural organization of the brain, following the acute and chronic administration of these compounds. At that time, the Center was based in the Department of Psychiatry. As the Center’s focus has tightened through the years, its base has expanded to include the Departments of Anatomy and Neurobiology, Pathology, and Psychiatry. There are plans to involve several other departments in the Medical Center, including the departments of Physiology, Pharmacology, and Pediatrics.

The Center’s current activities focus on the effects of narcotic-like drugs on the neurochemical and biochemical organization of the hypothalamus, particularly the effects of narcotics on the endocrine system. Cicero led early work at the Center, which demonstrated that the chronic administration of narcotics caused a marked atrophy of the secondary sex organs in the male rat. His subsequent studies focused on the mechanisms by which narcotics disrupt the function of the hypothalamic-pituitary-gonadal axis. "The atrophy," he explained, "is due exclusively to a drug-induced reduction in serum testosterone levels. The narcotics, however, do not act directly on the testes to reduce the production of testosterone. Rather, they appear to affect only the hypothalamic aspect of the hypothalamic-pituitary-gonadal axis." Cicero continued: "They do this by blocking the release of luteinizing hormone-releasing hormone (LH-RH) from its storage sites in the hypothalamus." The decline in the release of LH-RH leads in turn to a reduction in the secretion of LH from the anterior pituitary gland. Because LH stimulates production of testosterone by the testes, serum testosterone levels drop precipitously in animals treated with narcotics.

Research in the past year or two has demonstrated that specific opiate receptors exist in the hypothalamus and mediate the LH-depleting effects of the narcotics. After establishing the existence of the specific opiate receptors, Cicero speculated that an endogenous substance might exist in the brain which would normally bind the receptors and tonically inhibit the release of LH-RH. Other researchers had discovered a number of morphine-like factors, frequently called endorphins, enkephalins or, more generally, opioid peptides; so the existence of an endogenous substance seemed all the more plausible. To examine this question, Cicero and his colleagues administered the specific narcotic antagonist, naloxone, to male rats. Because this antagonist binds to opiate receptors and blocks the actions of all narcotic-like compounds, they reasoned that naloxone should elevate serum LH levels if an endogenous opioid peptide existed which normally inhibited the release of LH. Their studies conclu-
sively demonstrated that the administration of naloxone did, indeed, significantly elevate LH levels in the male rat. Moreover, they have recently found that these opioid peptides are also involved in the complex feedback control mechanisms influencing activity in the hypothalamic-pituitary-gonadal axis. "Thus," Cicero said, "it appears that opioid-containing neuronal elements are intimately involved in the normal regulation of activity in the hypothalamic-pituitary-gonadal axis, at least in the male rat." He added, however, that "we have been gratified to see our results replicated by many other investigators in the male and female of several species, including human."

A new line of research has recently been undertaken by Cicero's group. Since hormones play such an integral role in the cellular physiology and biochemistry of every organ in the body, "it is logical to assume that drug-induced alterations in these hormones will play a significant role in both the acute and chronic actions of these drugs," Cicero commented. Initial studies along these lines indicate that reductions in serum testosterone levels in male rats lead to a marked increase in the activities of liver alcohol dehydrogenase, the enzyme which is primarily responsible for degrading alcohol in the body. Thus, in testosterone-deficient animals there is an enhanced clearance of alcohol which means the animals metabolize alcohol more rapidly than do controls. Since morphine (and related narcotics) and alcohol are known to suppress testosterone levels, the investigators are currently evaluating the possibility that drug-induced modifications in serum testosterone levels might lead to an increase in the activity of liver alcohol dehydrogenase. "If it is possible to demonstrate this," Cicero commented, "we may be able to explain, on a biochemical level, the development of metabolic tolerance to alcohol and possibly cross-tolerance between it and other drugs." This would represent the first demonstration of a biochemical mechanism underlying the development of tolerance to any drug, and raises the possibility that administering testosterone could reverse the development of tolerance and cross-tolerance to several drugs of abuse. Cicero said, "Only preliminary work has been conducted up to the present time, but our results are quite promising. They do, indeed, suggest that testosterone plays a significant role in the regulation of alcohol dehydrogenase activity and may well be involved in the development of cross-tolerance between morphine and alcohol."

Several other related projects are also currently in progress in the Washington University Drug Abuse Research Center. W. Maxwell Cowan, M.D., Ph.D., former Head of the Department of Anatomy and Neurobiology at Washington University and now at the Salk Institute in California, continues his research with Cicero on a neuroanatomical approach to drug addiction. Cowan's approach is to understand further the anatomical organization of the endocrine-hypothalamic systems in an effort to guide future work on the effects of opiates or opioid peptides on neuroendocrine function. This research involves the use of a technique developed by Cowan and his associates. Radioactivity labeled amino acids are injected into discrete regions of the central nervous system, where they are taken up by cell bodies near the injection and become incorporated into proteins. These proteins then undergo axonal transport from the cell body to its various neuronal projections. The fibers of passage in these regions are not labeled because they do not incorporate the labeled amino acids into proteins. Hence, only projections of fibers from those cell bodies re-
ceiving the injections are labeled. With this technique, Cowan can then trace neuronal projections of very small diameter with high resolution to characterize fully their regional distribution in the brain. Another approach utilized by Cowan and his colleagues (principally Larry Swanson, Ph.D., formerly of Washington University School of Medicine and now of the Salk Institute) to the understanding of the neuroanatomical and functional organization of the hypothalamus, is the immunohistochemical identification of specific classes of neurosecretory cells. "These studies are of fundamental importance to our understanding of the organization of the hypothalamus," Cicero commented, "and will serve to guide the future direction of the entire Center's activities. We are most grateful for Dr. Cowan's past contributions and the role he will play in the future activities of the Center — even though he has now left WUMS."

John W. Olney, M.D., Professor of Psychiatry, in collaboration with Cicero, is working on a project to clarify the cellular origin, synaptic ultrastructure and functions of the central &beta;-endorphin system (a principal opioid peptide found in brain). The primary goals of this research are to lesion the arcuate nucleus of the hypothalamus by administering a number of amino acids, which have been termed "excitotoxic" by Olney. The term "excitotoxic" refers to the fact that certain amino acids normally found in brain excite or stimulate neurons at certain concentrations and, hence, may serve as neurotransmitters. However, at higher concentrations these substances tend to be highly toxic, resulting in significant cell death. Of particular interest is that the lesions produced by the administration of these excitotoxic substances after their systemic injection are very restricted to certain regions of brain. Olney and Cicero plan to use this technique electively to lesion the arcuate nucleus, which is significantly involved in neuroendocrine function and contains large amounts of &beta;-endorphin. Coupling this lesioning technique with immunohistochemical techniques for visualizing &beta;-endorphin, it is hoped that the cellular origins, synaptic ultrastructure and ultimately the function of the &beta;-endorphin system will be elaborated. While this project has been underway only since June 1980 significant progress has been made in developing improved methods for the lesioning techniques with excitotoxic amino acids. Moreover, preliminary studies carried out in conjunction with investigators at other institutions indicate that lesions of the arcuate nucleus result in functionally important changes in the &beta;-endorphin system. "This technique shows great promise for elucidating the role of the arcuate nucleus in regulating neuroendocrine function and in examining the role of opioid peptides in hypothalamic function," Cicero said.

Pilot studies of the influence of morphine and diazepam on the neurotoxicity of another excitotoxic amino acid, kainic acid, are being conducted by Terry A. Fuller, M.D. (79), Instructor in the Department of Psychiatry, and John W. Olney, M.D. These workers have found that morphine increases the neurotoxicity of kainic acid and that diazepam, on the contrary, suppresses it. Their studies have also just been initiated and they are actively exploring the mechanisms underlying these effects. Cicero commented: "Since morphine and diazepam are so widely used, studies designed to examine their mechanisms are badly needed. Fuller's and Olney's studies will provide some insight into the role of excitatory amino acids in the actions of these widely used compounds."

Additional studies are currently being solicited by Cicero, as Program Director of the Washington University Drug Abuse Research Center, not only to expand the research already being conducted into the biological aspects of acute and chronic narcotic abuse, but also to include a variety of other studies examining psychological, epidemiological and genetic aspects of drug abuse.

Dr. Cicero is author or co-author of 86 scientific papers in the general area of neuropharmacology with a heavy emphasis on various effects of narcotics and alcohol on brain function. In addition to being Program Director for the Drug Abuse Research Center, he is also the Biomedical Scientific Director of the Medical School's Alcoholism Research Center, funded by the National Institute on Alcohol Abuse and Alcoholism (NIAAA). This Center, headed by Dr. Samuel B. Guze, consists of a large, integrated program of psychosocial, genetic and biomedical research projects focusing on alcoholism. Lee Robins, M.D., (psychosocial) and Theodore Reich, M.D., (genetic) also serve as Scientific Directors under the direction of Dr. Guze. "Washington University is particularly distinguished by having two major research centers in the alcohol and drug abuse fields — and is the only institution in the country that has both types," Cicero remarked. "In addition, we very closely coordinate our activities and have consequently mounted a well-focused and integrated program to study virtually all aspects of substance abuse," Cicero said.

The two centers at Washington University serve as a major national resource for research into alcohol and other drugs and are nationally and internationally recognized for their excellence, according to NIDA and NIAAA officials. While the centers are already rather large and encompass a number of projects, both centers anticipate even more expansion of the scope of their research activities during the next five years.
Retired Professor and Wife Endow Professorship in Neurology

The Andrew B. Jones and Gretchen P. Jones Professorship in Neurology has been established at the School of Medicine by the Joneses, who initiated the endowment in 1976 with a donation of land in St. Louis County and later made a cash gift and then a recent pledge of 36 acres in Tennessee. The total endowment is more than $678,000. The chair will be occupied by William Landau, M.D., co-head of the Department of Neurology and Neurological Surgery.

Andrew B. Jones, who was born in 1890 in Tennessee, earned his M.D. degree at Vanderbilt University in 1916, and served his internship in the Department of Serology and Bacteriology at the university’s medical center. As a first lieutenant in the medical corps during World War I, Jones served in Georgia and in Washington, D.C., and with the 79th Division in France. In 1919, he began his medical internship at Barnes Hospital with Dr. George Dock. In 1920, he served as a resident in neurology with Dr. Schwab. Jones’ residency in psychiatry was at the University of Michigan in Ann Arbor.

He returned to Washington University School of Medicine in 1922 as a member of the faculty, and taught neurology and psychiatry until he retired from active practice in 1965. During the 1930s, Jones conducted a special study of the encephalitis outbreak in St. Louis and published several articles. He also made extensive clinical studies of the neurological complications of immunization against rabies. During World War II, Jones was chief of the encephalitis section of Barnes Hospital and psychiatric consultant to the Selective Service Agency in eastern Missouri.

During his active career, Jones held staff appointments at St. Luke’s, Missouri Baptist, Deaconess, DePaul, Barnard, Jewish, St. Louis and St. Louis County hospitals, and served as medical director of Glenwood Sanitarium for 25 years.

Today, the Joneses spend their winters at Lake Okeechobee in Florida and their summers on the Chickamauga Reservation, about 30 miles north of Chattanooga, Tennessee, near Jones’ birthplace.
In Memoriam:
Arpad I. Csapo, M.D.

Arpad I. Csapo, M.D., Ph.D (H.C.), Professor in the Department of Obstetrics and Gynecology at Washington University School of Medicine, and internationally recognized for his research in uterine physiology, died suddenly of a heart attack on February 7, 1981, at his home in St. Louis County. He was 63 years old.

A native of Szeged, Hungary, Csapo received his M.D. degree in 1943 from the University of Szeged. He completed his residency training in obstetrics and gynecology at the Semmelweis Medical University in Budapest. Working in the laboratory of Albert Szent-Gyorgyi (winner of the Nobel Prize in 1937 for his discoveries of Vitamin C and cellular oxidation), he achieved the isolation and quantification in uterine muscle of the proteins actin and myosin. This work led to his invitation to Uppsala, Sweden, as a Mannheimer Fellow, where he further characterized the physico-chemical properties of uterine actomyosin.

Trained as an obstetrician, Csapo was concerned with understanding and preventing premature births. Feeling that it was essential to achieve a better understanding of the maintenance and termination of pregnancy, he decided to follow the path of medical research, rather than that of clinical medicine.

While a staff member at the Carnegie Laboratory with George W. Corner, and later as a Lecturer in Obstetrics and Gynecology at Johns Hopkins Medical School, Csapo continued his actomyosin research, resulting in the discovery that estrogen affects uterine function by controlling actomyosin synthesis. Years of further experimentation, first as Associate Professor at the Rockefeller University and in 1963 as Professor at Washington University Medical School, supported Csapo's earlier hypothesis that pregnancy maintenance is determined by the balance of progesterone and prostaglandin. Thus, it was here in St. Louis that Csapo developed his now widely accepted "See-Saw Theory," that the natural activator of the uterus, prostaglandin, and the blocking hormone progesterone, must be in regulatory balance for pregnancy to continue. Through his work, physicians have an increased understanding of premature labor and methods to prevent it. His work on prostaglandin inhibitors led to the discovery of an effective treatment for painful menstrual cramps. More than 40 medical researchers began their scientific careers and received training in uterine physiology in Csapo's laboratory at the School of Medicine.

Csapo published over 200 articles in the field of uterine physiology and contributed chapters to several textbooks in Obstetrics and Gynecology. His honors include the Carnegie and Guggenheim Memorial Fellowships, the Ciba Foundation Award, National Institutes of Health Career Award, the Dенно Foundation Award, and the International Health Foundation Award. Csapo was the Director in St. Louis for the Program for International Education in Gynecology and Obstetrics which trained more than 300 fellows from 57 countries.

Dr. Csapo is survived by his wife, Elise, and three daughters, Ilona, Esther, and Marika. A memorial service was held on February 15 in Graham Chapel. An Arpad I. Csapo Fund to support young scientists has been established, and is being coordinated by the Department of Obstetrics and Gynecology.

Laurence Cheung, M.D., associate professor of surgery, was elected president-elect for 1980-81, and thereby president for 1981-82, of the Association for Academic Surgery.

Paula Clayton, M.D., professor of psychiatry, has been appointed head of the Department of Psychiatry at the University of Minnesota medical school. She is the first woman to head a department of the medical school at the University.

Maynard Olson, Ph.D., associate professor of genetics, has received a two-year grant, the Basil O'Connor starter research grant, through the March of Dimes Birth Defects Foundation. Olson is studying the molecular structure and detailed interrelationships of DNA molecules and chromosomes.

Carlos A. Perez, M.D., professor of radiology and director of the Division of Radiation Oncology, Mallinckrodt Institute of Radiology, was elected president-elect of the American Society of Therapeutic Radiologists. He is the youngest therapeutic radiologist to hold the office.

Robert E. Shank, M.D., Danforth Professor and head of the department of preventive medicine, was honored by the American Heart Association in January when the board of directors of the association, at the annual meeting, presented him with the Award of Merit. Shank received his M.D. degree here in 1939, and has held his present position since 1948.

Peter G. Tuteur, M.D., associate professor of medicine, received one of six appointments as Robert Wood Johnson Fellow for 1981-82, to study major health policy issues and their resolution in the political system. Tuteur will travel to Washington, D.C. for a one-year sabbatical, and will work with members of Congress on health issues.

Virginia Weldon, M.D., professor of pediatrics and assistant to the vice-chancellor for medical affairs, has been appointed to the National Advisory Research Resources Council of the NIH. She will serve through October 1984 on the council, which advises the director of the NIH about pertinent research programs, and reviews and makes recommendations about grant applications.
The 1981 Washington University Medical Center Alumni Association Annual Clinical Conference was attended by 71 alumni and friends from throughout the United States. For most participants, the annual conference began with flights from 21 home cities on Friday, January 30, and arriving in San Juan that afternoon and evening. This author has some difficulty in developing an "exciting" report, because it was a conference with few, if any, problems. The weather was beautiful throughout the cruise, all flights were on time, and all sanitation facilities worked.

August Geise, M.D., class of 1956 and President of the Alumni Association, organized an excellent program with a primary theme of neurologic, neurosurgical, and orthopedic clinical problems. A highly able faculty of Drs. Ed Lansche (class of '52), Ben Mayes (class of '66), and Bob Schultz (class of '55) and Augie Geise discussed a series of problems that included headaches, strokes, and low back pain. The scientific program was completed by lectures from Drs. Elmer Brown (class of '50 and Associate Dean for Continuing Medical Education) and Leonard Furlow, Jr. (class of '56) who presented updates in the fields of hematology and plastic surgery.

The author, Ronald G. Evens ('64) is a picture of concentration on the deck of the Cunard Countess.

The speakers, from left to right: Leonard Furlow; August Geise, Edward Lansche, Elmer Brown, Robert Schultz, Ben Mayes

Association president Dr. August Geise and Mrs. Geise
The conference was certainly not all work. Attendees left San Juan on the Cunard Countess Saturday evening for a week on the Caribbean with stops in Caracas, Grenada, Barbados, St. Lucia, and St. Thomas before returning to San Juan. On board ship, in addition to the clinical conferences, were a wide variety of activities that included swimming, skeet shooting, bingo, a casino, bridge tournament, exercise with Sweet Elegance (a dancing ensemble), running, nightly entertainment, and delicious eating.

At each port there were organized tours, and many took advantage of the always available beaches, snorkeling, sunning, and shopping in several duty-free ports.

Each participant has an individual idea of the highlights of the trip. We found many that include an overall superb time: the out-

The ship's physician, second from left, joins Drs. Geise, Schultz and Brown and Mrs. Brown.
standing organization of the tour by Group Travel, Inc., with the personal representation of Pam White and Ron Storm. Ron has been so helpful on our tours that he should be awarded an honorary degree. The get-acquainted luncheon and tour of old San Juan allowed many alumni to renew acquaintances. Birthdays were celebrated aboard ship by Leonard Furlow and Claire MacConnell and the Captain's cocktail party was enjoyed by everyone. The ship obtained and sold many photographs, but I am sure the best photography was by Dr. Ed Lansche. Everyone enjoyed the shopping and souvenir collecting, but the best has to be the collection of a driver’s license from St. Lucia by Dr. Harry Cole (class of '65).

Some of the hands on deck

Cocktail time, a time to renew acquaintances
The week conference ended all too soon with a return to much colder weather than the balmy breezes of the Caribbean. Everyone left with an increased appreciation of our Washington University Medical School and looks forward to returning to the annual conference in Maui in 1982.

—Ronald G. Evens, M.D., '64
Souvenir hunting at Grenada

Getting the group together in San Juan
Coming in to Saint Lucia
Improperly attired

"Style reflects one's idiosyncrasies," wrote Charles Eames, and speaking of peculiarities, there is a peculiar charm to a three-wheeled truck loaded with tires. Richard M. Ratzan, M.D., took the photo in 1976 while he was chief resident, internal medicine, at Jewish Hospital of St. Louis assigned to rotation at St. Louis City Hospital. Ratzan, an internist, is now working in the Emergency Room at John Dempsey Hospital, University of Connecticut Health Center. His wife, Susan Ratzan, M.D., was house officer at St. Louis Children's Hospital while the Ratzans were in St. Louis, and is now a full-time pediatric endocrinologist at the University of Connecticut.

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