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A COSMIC COLLABORATION

Imaging tumors with fiber optics
Daniel Boone Escorting Settlers Through the Cumberland Gap: Painted on consignment in 1851-1852 by George Caleb Bingham for St. Louisan Nathaniel Phillips, this oil on canvas represents an enduring symbol of America's pioneering spirit and westward expansion. In 1890, Phillips gave the painting to the St. Louis School and Museum of Fine Arts, a department of Washington University that was located on the original downtown St. Louis campus. Considered the most famous object in the University's Gallery of Art collection, the picture is part of an exhibition of Bingham’s genre paintings that will hang at the National Gallery of Art in Washington, D.C., from July 15 through September 30. The exhibit was organized by the Saint Louis Art Museum, its first venue, in association with the National Gallery of Art.
Cashing in on the crunch: Did you know the United States discards enough aluminum in three months’ time to completely rebuild the nation’s fleet of commercial aircraft? Read about our recycling effort on page 4. Photo by David Kilper.

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Washington and Monsanto Extend Research Agreement

Washington University and Monsanto Co. have extended their eight-year research agreement for an additional four years, bringing total funding commitments to nearly $100 million. The Washington University/Monsanto Biomedical Research Agreement is the largest research collaboration between an American company and an American university. It provides a framework for university and corporate researchers to collaborate in extensive investigations of proteins, peptides, and other molecules that modulate cellular function.

Such a collaborative program seeks to shorten markedly the time between fundamental discoveries and the development of novel preventive and therapeutic products for human disease. Key to Monsanto’s participation in the program is the research, development, and marketing capabilities of Searle, Monsanto’s wholly owned pharmaceutical subsidiary.

First signed in June 1982, the collaboration began with a $23.5 million commitment for five years. In 1986, after a favorable review by an independent panel of respected scientists, the agreement was extended through 1990 and was increased to approximately $62 million. The new extension calls for more than $9 million per year for each of the years 1991 through 1994.

The program supports research projects involving 120 University scientists. To date, the research has resulted in more than 40 patented or patent-pending discoveries that eventually could lead to commercially useful products. According to the agreement, patent rights on all inventions are owned by the University, and Monsanto has the right to an exclusive license under mutually acceptable terms.

The agreement was originated by David M. Kipnis, Adolphus Busch Professor and head of the Department of Medicine, and Howard A. Schneiderman, Monsanto’s senior vice president for research and development and chief scientist. The extension guarantees continuation of what generally is considered a unique and successful model of university/industry cooperation.

University Designated NASA’s Lead Geoscience Node

Washington has been designated the lead Geoscience Node of NASA’s Planetary Data System, NASA officials announced in January. The University is the site of the chief facility for storing and distributing much of the NASA data collected from the surfaces and interiors of Mercury, Venus, the moon, Mars, and the larger satellites of the outer planets. The Planetary Data System is managed by the Jet Propulsion Laboratory in Pasadena, California.

Raymond E. Arvidson, professor of earth and planetary sciences, is supervisor of the Geoscience Node, currently housed in Wilson Hall. Arvidson says the facility’s geoscience data from NASA’s past and future planetary missions will include processed images, sample information, and remote sensing observations of such missions as Apollo, Viking, and the Magellan.

Labs at Brown University, Arizona State University, the Massachusetts Institute of Technology, the Lunar and Planetary Institute, and NASA's Johnson Space Center will be "subnodes" to Washington's Geoscience Node. Labs at each of these institutions will specialize in interpreting and storing various subsets of the data collected during planetary explorations.

Arvidson is a member of the radar investigation group of NASA's Magellan Mission, an interdisciplinary scientist for the Mars Observer Mission, and a NASA committee member who will help implement the Soviet/American exchange of Mars data. He will be assisted in Geoscience Node tasks at the University by Edward A. Guinness, senior research associate in the McDonnell Center for the Space Sciences; Susan Slavney, system programmer; and Mary Dale-Bannister, data base administrator. The facility will be housed in 3,000 square feet of the new natural sciences building, to be completed in 1991. Equipment to store and assemble the data has been funded by a W.M. Keck Foundation Grant.

In collaboration with the Jet Propulsion Laboratory, the NASA Geoscience Node has begun producing CD-ROMs (compact-disc-read-only-memory, small plastic discs similar to compact discs played on stereos) with data from the 1989 Geologic Remote Sensing Field Experiment. This expedition involved intensive airborne mapping of Death Valley and the Lunar Crater volcanic field in Nevada that Arvidson and colleagues from other institutions undertook in summer 1989. The scientist and his colleagues used equipment similar to that which will be used on the Magellan and Mars Observer Missions.

The series of eight CD-ROMs will be distributed to more than 100 geologists worldwide and will provide the geological community a preview of the type of information the Magellan Mission will reveal after remote sensing equipment begins beaming data back from that planet in September 1990. "We are world leaders in this effort," says Arvidson.

Teacher Education Program Trains "Those Who Can"

Washington University figures prominently in a new book on the nation's education crisis that emphasizes the need to prepare more talented students for the teaching profession. Published by the Association of American Colleges (AAC), Those Who Can features notable teacher education programs at Washington and 10 other schools, including Princeton and Wesleyan universities and Hampshire College. Linda Salamon, dean of the College of Arts and Sciences and a former chairperson of the association, served on the study's advisory committee.

Those Who Can recommends an integrated approach to teacher education, one that "breaks down the distinctions between liberal and professional study." The book highlights Washington University as one of the few schools with such an integrated program already in place. The education department is located within the College of Arts and Sciences, the authors point out, and seeks to develop "reflective practitioners."

As an example, the book describes the "professional semester" in which seniors take a number of education courses simultaneously. The assignments for Reading Methods, Mathematics Methods, Children's Literature, and Principles of Teaching are closely tied. "Through this internal integration, students are better able to see links among subjects," the book says. A full schedule, four days a week in the classrooms of nearby school districts and Fridays on campus for class, ensures that the students' course work and fieldwork are likewise linked. And by "clustering" student teachers in a few area schools, faculty can work closely with classroom teachers on student teachers' progress.

Those Who Can explains that this comprehensive, concentrated approach offers Washington's education students a well-rounded liberal arts education as well. Many of the school's educational foundations courses have a liberal arts orientation and fulfill general education requirements for students in the College of Arts and Sciences.

The AAC is the only national organization promoting liberal learning at U.S. colleges and universities. Its membership includes 560 public and private institutions.
Nation's Bridges Declared Unsafe

“The condition of bridges and the state of their funding in the United States is so poor that if we were a Third World country, we'd go to the World Bank for a loan,” says Lonnie Haefner, professor of civil engineering. According to Haefner, at least 43 percent of the nearly 600,000 bridges in the United States are poorly maintained, and thus unsafe.

A specialist in infrastructure problems, Haefner recently presented a report to the United States Congress Office of Technology Assessment. The report, The Impact of Advanced Technology and Innovation on Public Works Management and Decision-making, focuses on ways the United States can plan to improve and manage its infrastructure into the next century.

The transportation expert blames the high number of unsafe bridges on negligent maintenance due to poor funding. He cites a 20 percent reduction in federal dollars to the Federal Highway Program between 1982 and 1987, a decline from $2 billion per year to $1.6 billion per year, prompted by the government's need to reduce annual spending. Experts say the United States will need $54 billion over the next decade, or $5.4 billion per year, to maintain its bridges.

To fund needed repairs, Haefner offers several suggestions: more toll roads, modifications in truck-weight users' fees, special district funding that could be funneled into a maintenance account, and the leasing of bridges—an incentive for private industry to build bridges that the government would lease.

He also suggests a domestic equivalent to the World Bank, "a domestic development bank that would treat the squeakiest wheels first."

Medical School Launches Recycling Program

The success is apparent in the statistics: 18 tons of paper recycled, 131,400 kilowatt hours of electricity conserved, 7,443 barrels of oil saved, 306 trees left standing, and $1,937 earned. Those are the numbers posted by the School of Medicine's fledgling recycling program during its first 11 months of operation in several participating departments.

Under the direction of Jo Louise Seltzer, research assistant professor of dermatology, and Paul P. Hipp, director of environmental safety, the program was launched at the Department of Medicine one year ago. To date, portions of the Departments of Anesthesiology, Biochemistry, Occupational Therapy, Pathology, and Psychiatry have joined the voluntary effort.

In the recycling process, which requires that the "raw materials be recycled,"

Washington People in the News

David T. Blasingame, associate vice chancellor and director of alumni and development programs, and M. Fredric Volkman, associate vice chancellor and director of public relations, will become vice chancellors effective July 1. They will succeed Herbert F. Hitzeman, Jr., who retires as senior vice chancellor for university relations on June 30.

Blasingame joined the University in 1974 as associate director of alumni relations. After a series of promotions he was named associate vice chancellor, assuming responsibility for the offices of corporate and foundation relations and planned giving, as well as managing the alumni and development programs for all schools, except medicine. As vice chancellor for alumni and development programs, he will add...
Make haste with waste: Assistant Professor Jo Louise Seltzer and environmental safety director Paul Hipps witness their recycling operation.

as pure and homogeneous as possible, only white paper and aluminum cans are separated from the departments’ waste stream.

To organize the system, the recycling team designed and labeled an inexpensive wastebox to sit alongside each office desk and in every lab. A large collection drum was placed within 100 yards to accept the contents of the boxes. Employees keep a lid on costs by dumping their own boxes and taking their cans to the drums, yet they don’t have to do any packing or heavy carrying. The recyclable materials are then delivered to Jefferson-Smurfit, a St. Louis-based corporation involved in recycling.

Two elements have been fundamental to the program’s early success: widespread enthusiasm for the plan and an easy-to-use system. Administrators lent the project their immediate support early on. Robert J. Hickok, assistant vice chancellor for medical affairs and chief facilities officer, backed the program by approving the use of environmental safety office personnel and resources. Essential to the program’s success, however, has been the cooperation of those who contribute daily by carefully disposing of their wastepaper and cans in the containers provided.

Seltzer and Hipps plan to add other interested departments at the rate of one every two months. Because they believe academic institutions should take the lead in acting to preserve the environment, they are offering their plan as a model for others. The program is one of the very few formal institutional recycling operations at work in U.S. higher education.

Contributors: Kate Berger, Elizabeth Estes, Tony Fitzpatrick, Steve Kohler, Carolyn Sanford
The Olin fellowship program prepares gifted women for careers in education and the professions.

by Susan Mowris

Brass glinted on their impeccable uniforms, each iron-gray head was trimmed in a no-nonsense crew. The three admirals created a picture of distinguished authority, and Nancy Mattson, a young investment banker, faced the imposing trio. Eyebrows shot up in astonishment as Mattson explained that she would be leading discussions involving the largest leveraged lease agreement for chartering cargo ships for the United States Navy. When contract negotiations were concluded, amazement gave way to appreciation. Mattson and her company saved the United States government $500 million and were awarded the Distinguished Public Service Award from the Department of the Navy.

Mattson, M.B.A. '78, is one of Washington's 87 Olin fellows making substantial contribu-

ADELE KONKEL ANDERSON, J.D.'81, followed an unusual route to her selection as Pueblo County court judge in 1989. She has been a nun, a teacher, a practicing lawyer, a non-lawyer judge, and now she is one of the first women in recent times to serve as county judge in Pueblo, Colorado. She was also one of the first female law associates and one of the first female law partners in Pueblo, a town of 100,000 some 35 miles south of Colorado Springs.

Anderson is founding editor of the Pueblo Bar Association newsletter and has served as chair of the Legislative Committee for the bar. "We're down in the trenches on many issues. In Colorado there is a saying — "There's Denver, and then there is everything else." We're the vocal part of everything else," she quips. "Our bar association has made a definite impact."

Being a lawyer has its advantages, says Anderson. "While there is little difference in authority between my present position and my position as judge in Kansas before law school, there is a big difference in the number of cases I handle on a daily basis. I've found that with my education and experience, decisions are easier to make in many cases than when I was a non-lawyer judge. I now have an analytical framework to hang my thoughts on, and I understand the principles of law involved."

"There are now close to 20 practicing women lawyers in Pueblo, and
tions in their chosen fields, succeeding in professions that have been traditionally male-dominated, such as science, medicine, law, business, and architecture. Since its establishment in 1975, the Mr. and Mrs. Spencer T. Olin Fellowships for Women program, by virtue of its commitment and size, has been recognized nationwide for the opportunities it provides to academically outstanding female graduate students, who are awarded annual tuition/stipend aid packages ranging from $14,000 to $27,000 to prepare for careers in higher education and the professions. Each year, six to 10 gifted women are selected from more than 200 applicants, with as many as 30 on tenure at a time pursuing advanced degrees.

The program was instituted as a joint venture between the Monticello College Foundation and Washington University. I was surprised at the number of women judges at the state conferences, but it is still a very small percentage. It is very important that women support qualified women for positions. Women who are appointed must be of high quality and visible in order to win over those with ingrained prejudices.

SUSAN DOWNS, Ph.D. '84, finds it ironic that she was initially denied a fellowship in 1966 at the University of Oregon because she was a woman, and when she returned to school in 1980, the Olin fellowship she received at Washington was open exclusively to women.

A former Peace Corps volunteer, Downs is interim associate dean at the School of Social Work at Wayne State University in Detroit and an associate professor who teaches classes in child welfare policies and social welfare history.

Downs, her husband, and two children left their home in Portland so Downs could pursue her studies in St. Louis. "I was past 38 and not getting any younger, my children were five and eight, and my husband was practicing law, but we said, 'Let's do it,' so we came to St. Louis by way of the old wagon train route, only in reverse," she laughs.

"I was greatly influenced to go to Washington University by the Olin fellowship stipend and by an outstanding social work teacher there, Martha Ozawa, who had been a colleague of my father's when he taught social work at Portland State. I was also drawn by the school's strong emphasis on research.

"Social work is an area where women have been accepted as achievers—look at Jane Addams," says Downs. "Our students face important challenges, such as restoring to community life the large number of children neglected by their families and society. I find I have a chance to contribute to how social work education should evolve in the 1990s."

JULIE FIEZ joined the Olin fellowship program in 1987 as a doctoral candidate in neuroscience. "I chose biology because I was always fascinated by how life works, especially how the brain works," says Fiez, who specializes in futuristic sounding studies of the brain.

Through studies using positron...
When Monticello College, a two-year liberal arts college for women, closed its doors in 1971, the college's trustees decided to follow the school's charter established 140 years prior, which was to "promote female education." The fellowship was named for Monticello's longtime supporters, Mr. and Mrs. Spencer T. Olin.

Each year, a two-day conference for the Olin fellows has been held on Washington's campus. The conference initiates an academic spirit of camaraderie and participation among the fellows and provides a lifeline of communication and support among women of achievement.

The conferences delve into significant issues for women. Stimulating and thought-provoking speakers have included Juanita Kreps, former Secretary of Commerce; Sir Peter and Lady Jean Medawar, British biologists; feminist authors Betty Friedan and Marilyn French; Jill Conway, president of Smith College; Johnnetta Cole, president of Spelman College; Beverly Sills, former president of the New York City Opera; and psychologist Sharry Langdale.

Conference topics have reflected women's efforts to creatively meet the challenges that changing roles effect. Over the years, women have reworked the system by opening doors to employment. They have initiated a re-structuring of homefront concerns like shared family responsibilities and the need for quality child-care programs. They have been nominated as a vice-presidential candidate, have been appointed to the Supreme Court, and have rocketed into space.


Karen Levin Coburn, co-author of The New Assertive Woman, Hitting Our Stride, and Letting Go, is associate dean for student development at Washington. She has attended the Olin conferences since their beginning. "One of the changes I have seen

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**Julie Fiez**

emission tomography, or PET, Fiez is concentrating on procedural learning and language processing. "The method we use to map the brain correlates blood flow with neural function," she explains. "After a low-level radioactive tracer is injected into a person's bloodstream, the individual is asked to perform a task. By following the radioactive tracer into the areas of more activity or increased blood flow, you are able to see the different brain areas necessary to perform an activity.

"It is easy to become obsessed with science," claims Fiez, "because all of your questions are never answered, yet that's why many people enter science. They want to know the 'whys' behind the 'whats.' It seems as if each question you
in society is the increased value of women as intellectuals,” observes Coburn. “There has been a rediscovery of women writers and artists and a virtual explosion of female scholarship. In the field of psychology, Carol Gilligan’s book, *In a Different Voice*, has had a major impact on how we think about men and women. Gilligan’s associate at Harvard, Sharry Langdale, spoke at the conference here in 1985. Their research on divergent male/female approaches to solving problems has influenced what we know about development, how we do therapy, and how we teach management and leadership skills, and has provided more information about relationships.”

Coburn continues, citing Betty Friedan’s *The Second Stage*. “Friedan spoke of a new awareness in how men and women are approaching issues together. Men are starting to raise questions about being expressive, and there are several coed student organizations here that are concerned with the status of women and with gender issues.”

Joyce Trebilcot, associate professor of philosophy and coordinator of Women’s

answer only leads you to 10 more questions.”

Despite the long hours she devotes to brain studies, Fiez manages to find time for other projects, such as the Brittany Woods Student/Olin Fellows Program, created in 1988. The program provides young girls from Brittany Woods, a middle school in St. Louis’ University City school district, with access to educational, social, and cultural activities. “In the process,” says Fiez, “we hope that the Olin fellows involved will serve as role models and that lasting friendships will develop between students and the fellows.”

MARY ANN LAZARUS received her master’s in architecture from Washington in 1978. She has been with the internationally known firm of Hellmuth, Obata & Kassabaum (HOK) since 1980.

“I saw how exciting architecture could be when I worked for a husband-wife firm and was provided with a great female role model,” says Lazarus, referring to her early employment at a small firm in Arlington, Massachusetts, on the outskirts of Boston. Having both a mentor and a “tangible dream” influenced her decision to pursue a master’s degree.

Lazarus entered HOK as a junior architect and is now the firm’s only female vice president in architecture in St. Louis. “HOK has been a good experience for me. In my second year, they gave me a chance to head a $12 million project,” she says. “When I had my two children, the firm was amenable to maternity leave and flexible about my hours.”

Lazarus notes, however, that her firm’s policies do not reflect the national consensus. “We’re not equal yet in this profession. When I walk into a room with clients or contractors, there is no question they react to a female project manager.”

“We’ve a long way to go in this field, but conditions are improving. While only a small percentage of the American Institute of Architects’ members are female, they are becoming active and well represented as officers,” claims Lazarus, a director of the Missouri Council of Architects.

Lazarus says her husband, architect Daniel Jay, M.Arch.’79, shares her professional and familial interests and concerns. “Raising our
People lose track of the journey they are on. The reflective track, dealing with life's eternal verities, is important, too.

—Katherine Drescher

Studies at Washington, says, “The movement has gained a great richness in focusing on a broad spectrum of issues. Women today are more organized and effective in bringing about change.” What has not changed, she says, are “women’s concerns, which include violence against women, the right to determine when and whether we will have children, the availability of quality child care and health care, and the economic status of women — most of the poor are women and children.”

Friedan’s speech touched on what the feminist called the “life-changing, life-opening power that has come from the movement.” She spoke of the possibilities of “transcending polarities when women and men put values of life first to see that resources are used to enhance and make possible a good life for us all.” She also noted that women did not want to be men with all the pitfalls the fast track brings, including “truncated lives,” and was heartened to discover that men were starting to appreciate some of the joys and rewards that come from being with family.

family is a ‘we’ thing — very much a shared responsibility,” she emphasizes.

ELLEN LI, M.D./Ph.D. ’80, is no stranger to dual roles. After obtaining a doctor of medicine degree and a doctor of philosophy degree in biochemistry through the Medical Scientist Training Program, completing a residency in internal medicine, and a fellowship in gastroenterology, Li was appointed assistant professor of medicine in the Department of Medicine at Washington University. She also serves as a consultant in gastroenterology at Barnes Hospital.

Li is researching Entamoeba histolytica, a protozoan parasite that causes dysentery and liver abscesses. Her research, a collaborative effort with her husband, Samuel Stanley, Jr., assistant professor of medicine, has resulted in successfully cloning an Entamoeba histolytica protein that appears to be naturally immunogenic. “It looks like we are the first to do so,” says Li.

The husband-and-wife team publishes together, as well as shares lab facilities. Says Li, “In terms of doing experiments, our work is a closer type of communication than most lab partners’. Basically, we complement each other. My background is in molecular biology and his is in immunology.”

The partnership also has produced three children ages five, three, and one.

Li would like to see changes in educational expectations for women: “We should be taught early on how to deal with competition and its realities. There is a tendency not to take risks for fear of failing.”

NANCY MATISON, M.B.A. ’78, found success early in her finance career. Following graduation from Washington, Mattson became a vice president at Bank America in San Francisco in just four years. At age 28, she co-founded with three partners Argent Group, a boutique investment banking firm with offices in San Francisco and New York. Their first client, the United States Navy, proved beneficial to both parties. Because the firm saved the Navy more than $500 million, it was presented a Distinguished Public Service Award, an honor that had never before been awarded to civilians during the Reagan administration.
Increased opportunities for women have not come without increased responsibilities. At the first conference, economist Juanita Kreps proclaimed, "It is easier to change the institutions to open up the opportunities than it is to find the time to take advantage of all of them." While having the freedom of choice is a positive result of the movement, juggling the demands of career and family increasingly challenges women today.

Katherine "Kitty" Drescher, coordinator of numerous Olin conferences and a Washington University trustee, says, "The Olin fellows are very involved with the problems of being superwomen. They struggle with the difficult issues regarding family and career. Women still feel they have to do it all. The main issue facing both men and women involves too much stress placed on success. People lose track of the journey they are on. The reflective track, dealing with life's eternal verities, is important, too."

Young Olin fellows like Julie Fiez say they have gained insight from the conferences. "I have never received the message that there is something I should not do because I'm a woman," says Fiez, who hopes to complete a doctorate in neurosciences in two to three years. "A lot of women my age have benefited from those who have gone before us."

The 1989 conference featured an inspiring speech by Johnnetta Cole. Her talk, titled "Education and Empowerment: Preparing New Women for a New Century," stirred listeners with her views on the type of education young women will need in America's communities, the nation, and the world. "Women must make a commitment to lifelong learning and a serious, serious passion for knowledge," offered Cole, who expressed her hope that "we're coming out of the time when so many women, like young men, are looking...for a life centered on acquiring more and more and more material things. Let us not do that at the expense of the ranges of careers and professions that can greatly excite and bring joy to our women."

What brand of leadership might new women bring to a new century? Meet six Olin fellows, who are among the women leading the way.

Innovative approaches to financing are the lifeblood of the Argent Group. "Last year we completed a $215 million auto-financing lease with Avis, one of the first of its kind because a special structure was needed," says Mattson. The firm also has financed $1.5 billion of equipment for MCI, including one of the first satellite lease transactions.

As Argent's chief financial officer, a managing director, and negotiator, Mattson must devote time to developing and hiring bright, creative employees. Through a recruiting technique she initiated at Argent, every year since 1984 the company has enlisted summer interns from the John M. Olin School of Business; two have since joined the staff. "We've had a lot of success with the program," says Mattson.
Fiber optics technology developed by astrophysicists finds new applications in radiation therapy.

A bundle of scintillating optical fibers creates a vision of beauty.

A Common
John W. Wong's highly charged, excitable nature resembles the subatomic particles he shuffles on a daily basis as assistant professor of radiation physics at the School of Medicine's Mallinckrodt Institute of Radiology. Mention two of his favorite topics — electrons and protons — and Wong flies into an animated discourse on the difference between a red snooker ball scattering a sea of other red balls on a billiard table and a bowling ball barreling through a series of Ping-Pong balls.

Hopping from the depths of inner space to the edges of the real world and back is, in a sense, a part of Wong's job. In his laboratory, Wong uses technical achievements derived from physicists' basic research. What he may never have expected, however, was that techniques developed by physicists to study cosmic rays originating in the far reaches of the Milky Way galaxy might be used to develop a device that may have practical applications in the radiation therapy rooms at the School of Medicine.

That is exactly what happened in Wong's unusual collaboration with astrophysicists at the University's McDonnell Center for Space Sciences and the Department of Physics. Together, the researchers created a new on-line fiber optic imaging device that allows physicians to verify in real time the exact placement of a radiation therapy beam on a tumor. "This is probably one of the most important technical improvements to treatment verification and radiation therapy," claims Wong, turning to the device, an elegant metal box approximately 2 feet long, 6 inches tall, and 1½ feet wide, with...
“Physicists are interested in looking at cosmic rays, but what they are measuring is radiation dose.”
— John W. Wong

thin, angel hair filaments of plastic extending from one end to a video camera.

Wong recalls the day five years ago when he picked up a copy of Washington University Magazine. One item captured his fancy. It featured a high-resolution cross section of special optical fibers developed by University astrophysicists for cosmic ray research. “I saw a picture of these fibers and I thought, ‘Wow, I could use that,’ ” recalls Wong, who that afternoon telephoned W. Robert Binns, research professor of physics, to arrange a meeting for the following day.

Binns and colleagues John W. Epstein, experiment manager; Joseph Klarmann, professor of physics; and Martin H. Israel, professor of physics and now dean of the Faculty of Arts and Sciences, are part of the cosmic ray group in the Department of Physics that collaborated on the imaging device. The department has conducted cosmic ray studies for more than 40 years.

Cosmic rays are high-energy atomic nuclei, ubiquitous in space, moving at nearly the speed of light. The exact origin of these particles remains a mystery, but the source of the energy for their acceleration is believed to come from supernovae. “The primary motivation for studying heavy nuclei in the cosmic radiation is to determine their origin, to study their acceleration, and to identify the differences between this sample of matter from the Milky Way galaxy and matter from our solar system,” says Binns. “Although the composition of galactic matter can be studied in other ways, cosmic rays provide the only direct means of studying matter that we are sure originates outside of our solar system.”

In the early 1980s, the cosmic ray group began experimenting with scintillating optical fibers and video cameras to create a better cosmic ray detector. The physicists used a rod of plastic laced with a complex organic molecule, or “scintillator,” drawn into small fibers. Atomic particles entering this special plastic lose some or all of their energy, causing the scintillator to flash. Because these light bursts are directly related to the electric charge of the particle and its speed as it passes through the plastic, and because these measurements can be transmitted immediately to Earth for computer analysis, scientists can use the light bursts to study rays in space. The group threw itself into the task of working with these new fibers, developing various configurations for several cosmic ray applications, one of which captured Wong’s eye.

In a cosmic ray detector, a series of as many as 100,000 fibers are gathered together in bundles. A cosmic ray enters these fibers, exciting molecules that give out a burst of light. Part of that light zips down to the end of each fiber and can be seen by the video camera.

The physics group recently learned that an experiment they proposed in collaboration with scientists from the Goddard Space Flight Center, the University of Chicago, and the California Institute of Technology will be mounted on the first U.S. space station, Freedom. Called the Large Isotope Spectrometer for Astromag, or LISA, the experiment will perform precise measurements of the abundances of nuclear isotopes that originate in deep reaches of the galaxy. It is expected to be launched by the space shuttle in 1998-1999.
When Wong learned of the cosmic ray group's fiber optics research, he knew immediately that it could have applications in his field. "These physicists are interested in looking at cosmic rays, but what they are measuring is radiation dose. And that has a direct application to radiation therapy," says Wong.

At their first meeting, Binns recalled, Wong presented several challenging technical problems regarding radiation therapy. After much discussion, the researchers decided to explore the possibility of collaboration. Just two weeks later, the team of five had devised a new technique for measuring radiation dose, whereby a sheet of plastic scintillator is immersed in water and viewed by a video camera. When the scintillator is irradiated, the dose distribution in the water can be determined quickly and accurately. Water dosimetry is important, since radiation dose in water is very similar to that in the human body.

However, it took another two years for the researchers to create the fiber optic imaging technique to monitor cancer treatments in real time. Hundreds of tests were conducted over a period of a year to arrive at a prototype device.

"The current method of treatment verification," explains Wong, "is to place a radiographic film under the patient. The X-ray beam going through the patient will expose the film and make a shadowgraph. The treatment is interrupted, the film removed, developed, and then examined."

This technique harbors a number of major, frustrating drawbacks. During a normal course of treatment, most doctors have only one film per week developed. Meanwhile, a typical schedule will involve a patient receiving one-minute daily doses of three to four beams during a month-long treatment.

In the past, the doctor could only see the period when the film was exposed. Because the patient's position on the machine may change slightly from day to day, it was difficult to ensure absolute accuracy of treatment, especially with patients like the very young, who tend to fidget. The fiber optic imaging device takes the place of radiographic film under the patient. Images captured during treatment can be seen.
immediately on a video screen, then stored and enhanced by a computer.

To demonstrate, Wong presses a few keys on his computer to call up a series of images depicting a tumor in a patient’s lung. Using a rudimentary animation technique, he plays the series of six still images in rapid succession breathing life into the gray mass, which now appears to pulsate on the computer screen.

The advance has important implications. Now a doctor can place increased confidence in the accuracy of treatments and can consider administering higher doses of radiation by using more complex beam arrangements during each session. The device allows physicians to consider new approaches and makes possible the study of inherent variations of treatment on a daily basis.

Because the device creates digital images, they can be stored on computer disks and then manipulated or examined in several new ways. This ability opens the door to developing innovative techniques like conformal therapy, in which the lead-blocking arrangement (to protect organs) changes continuously by computer control to increase the radiation dose to the tumor while reducing dose to sensitive organs.

The process of producing and forming 65,000 fibers into the imaging device is “very tedious and labor-intensive,” says Epstein. It begins with the polymerization of styrene monomer. If scintillation plastic is desired, wave-shifting dye is blended into the monomer, imbuing the liquid with a colorful, glimmery sheen. The liquid is filtered into a long, slender aluminum tube that is placed into a 125-degree Celsius oven. Polymerization is completed after five days, and the solid plastic is cooled and removed from the aluminum mold.

The plastic mass is then machined to fit tightly into a clear acrylic jacket, or “clad,” which has a lower index of refraction. Using elevated temperature and pressure, Epstein produces a smooth, square preform out of the styrene core and clad tube. The plastic preform is now ready for the drawing ovens, which will heat and soften the plastic to produce a continuous fiber measuring one-and-a-half millimeters square. In the heating chamber, the preform bottom softens and drops down about four feet. The connecting fiber is placed in a pinched wheel assembly and wrapped around a drawing wheel measuring approximately six feet in diameter. It is pulled at a precise speed to
A fiber matrix

create a fiber size of 1/16th of an inch.

After fibers are cut to approximately 18 inches long, 256 of them are reassembled into a 16-by-16-fiber matrix, fused, and heated in the second draw. At this point, a plastic emerges that looks like an elongated ice pick. Normally the physicists would cut off and discard the thick top and use only the fine fibers beneath to create a cosmic ray instrument. Epstein recognized that this discarded portion proved the very key to solving their major problem of how to get the image from beneath the patient to a camera without using a large mirror. He glued the plastic squares together into a 16-by-16-fiber matrix and placed a fluorescent screen on top. The tapering thin filaments were bent and held underneath in a bundle that goes directly to the camera. Truly an elegant solution to high-energy X-ray imaging.

Klarmann enjoys the fact that serendipity played such a large role in the creation of the imaging device. “I never ever thought there would be any practical applications of my cosmic ray research,” he admits, acknowledging that “scientists, least of all, can judge what applications their research will have.” Yet the new discovery supports one of his basic beliefs: “Let the human brain attack diverse problems, no matter how theoretical, and lo and behold, they can come together and fit practical problems.”

Israel, who is fond of reminding people that the stars contain the origins of the basic building blocks for terrestrial life, points to another important aspect of this new collaborative discovery. It reconfirms the importance of doing basic science at a university, where researchers in a variety of disparate fields are encouraged to talk with, and learn from, one another.

As Israel explains, “In a university setting there is an unparalleled ease of communication and cooperation. That’s part of what a university offers to the country as a whole. We were able to create this device because Washington University has an excellent medical school and an excellent physics department, and the researchers were encouraged to talk to one another.”

— Joseph Klarmann

Out of This World

Advances in space exploration have greatly influenced our daily lives. Realizing the vast practical potential of space-related discoveries, NASA has established its own technical utilization office in Baltimore and industrial centers and affiliates throughout the United States. NASA calls these applications “spin-offs” and even produces an annual publication with the same name.

Walter Heiland, manager of the Baltimore office, can spin off endlessly himself on the influence of space exploration experiments. “NASA discoveries have found their way into products and services commercially available to everyone,” offers Heiland, whose studies show a tenfold return for every tax dollar invested in NASA’s research and development efforts.

Ask Heiland to list items that contain space technology and get ready for a catalog of nearly 30,000 spin-offs. His list runs the gamut and includes the following:

- The coating used on sunglasses to keep out ultraviolet rays
- “Moonboot” athletic shoes with soles containing coils for extra shock absorbency
- The Statue of Liberty’s zinc-rich coating that will keep it rust-free for years
- Firefighting equipment, including breathing apparatus and protective garments first used in the Apollo programs
- Solar-powered photovoltaic conversion cells found in calculators and home heating systems.
- Foam material used in seat cushions, football helmets, chest protectors, and hand exersizers
- Pressurized toothpaste tube containers
- Gas-permeable contact lenses

Heiland notes that NASA has published more than 12,000 technical briefs on inventions, each of which is considered novel and transferable. “The possibilities are beyond comprehension and many are completely unrelated to us even though all of NASA’s work deals with space. It’s wonderful to see technology that can be used twice—once up there,” says Heiland, “and once down here.” —M.W.
Revolutionary treatment of alcoholism through social action spawns era of the disease model.

It's a revolving door. An alcoholic who gets drunk, commits a crime and lands in jail, returns to society without treatment, and gets drunk again.

Washington sociology professor David J. Pittman deplored the process in 1958 in his landmark book, *Revolving Door: A Study of the Chronic Police Case Inebriate*, and he still condemns it today. He wrote the book for his doctoral dissertation at the University of Chicago but conducted the study on skid row in Rochester, New York. To this day, he refers to skid row denizens with committed concern because he feels such compassion for those societal victims.

“Our study showed that repeated jailing of public drunkenness offenders who were alcoholic had failed to deter them from getting drunk again,” he said in his McMillan Hall office. “We advocated treatment and rehabilitation instead of punishment and custodial care.”

Pittman credits his mother for teaching him that alcoholism was an illness, not an immoral condition. His father, an alcoholic,
"Instead of attacking alcohol itself as the offending agent, we need to ask ourselves, 'What is it about our society that creates such an insatiable need for drugs and alcohol?'"

— DAVID PITTMAN

had been jailed once for public intoxication. "It struck me then as the height of folly to jail an individual who had an illness," Pittman says.

Armed with his book, which proposed a revolutionary social action plan for alcohol treatment centers—Pittman later coined the term "detoxification centers"—the 31-year-old self-professed activist joined the Washington faculty in 1958 as an assistant professor. He held a joint appointment—sociology on the Hilltop Campus and psychiatry at the medical school.

Within five years, he became director of the University's Social Science Institute, and by 1976, was named chair of the sociology department. He resigned as chair in 1985 to return to research and teaching.

Pittman could be called a 1960s sociologist. He believed in change through social action; he became a "field participant" with the men of skid row, rubbing elbows with the victims he sought to help. During a period of great innovation and social change, he emerged the teeming optimist, believing that all public drunkenness offenders would be removed from their jail cells and placed in treatment.

After earning his master's degree in sociology at the University of North Carolina at Chapel Hill, Pittman left the South for a teaching position at the University of Rochester. While serving on the faculty there, he connected with several influential alcohol researchers, most of whom were associated with the Yale Center of Studies on Alcohol. The center stressed an interdisciplinary approach through interaction of the behavioral, biological, and natural sciences.

Eager to continue his education, Pittman, on the advice of a colleague, traveled to the University of Chicago. There, he picked up the threads of interdisciplinary study in the doctoral program in human development.

Pittman began traveling overseas to meetings on alcohol research and treatment. As a result, he became interested in the transcultural aspects of alcoholism, in part, he says, "from the training we received in anthropology to view all societies that have existed historically and cross culturally as experiments in civilization."

Pittman is grateful for having worked under two Washington faculty members in the early 1960s: Nicholas Demerath, chair of sociology, and Edwin Gildea, chair of psychiatry. Demerath introduced Pittman to urban sociology. Through Gildea, Pittman met George Ulett, a young psychiatrist who was trying to convert an old, unused hydrotherapy ward into an alcoholism treatment ward at Malcolm Bliss Mental Health Center in St. Louis. The ward was replete with bathtubs that, when filled, were used to calm mental patients before some of the now common tranquilizers became a remedy.

Pittman, Ulett, and social worker Dorothy Stauffer won a U.S. government grant in 1960 to establish an alcoholism unit at the health center. They were assisted by Joseph Kendis, the first physician in Missouri to treat alcoholics as patients, and St. Louis Globe-Democrat reporter Marguerite Shepard, who had adopted their cause. The research team eventually raised $50,000—by today's standards a sum well over $300,000—to match the government grant.

The St. Louis Alcoholism Treatment and Research Center, the first in Missouri, incorporated ideas from London, Amsterdam, Vienna, and Warsaw, as a result of Pittman's frequent trips to Europe. The team had to re-educate the staff working in the new unit much in the same way it would retrain staff in an AIDS unit today. "There was a pervasive feeling that alcoholism basically was derived from a moral weakness and was not
a treatable illness,” Pittman says. “Alcoholics were viewed as undesirable patients because they lacked motivation and did not pay their bills. It was very unusual to find health insurance coverage for patients whose primary diagnosis was alcoholism.”

A follow-up study on the first patients treated at the new center showed that even those who received only seven to 10 days of medical, psychological, and social treatment showed improvement over those who were not treated. Without benefit of the center, Pittman says, “a lot of alcoholics were treated in basements by other alcoholics. Treatment against delirium tremens, or d.t.’s, included shots of whiskey and gradual withdrawal from alcohol.”

Alcoholism was stigmatized as an immoral condition, Pittman emphasizes, and alcoholic women were doubly scorned. Presumably, women were to live by stricter moral standards than men. The public was either unaware of, or ignored, the disease aspect of alcoholism. Researchers fell under the same prejudice. They were suspected of being alcoholics themselves or having other hidden agendas.

But despite the public attitude, the team prevailed, and their center became a world model. “Our goal was to move these people out of the court systems and correctional institutions, much as the mental patients were removed from jail at the turn of the century, remove the moral stigma, treat the disease, rehabilitate the patients, and return them to society as productive members,” Pittman says.

In 1964, Pittman coauthored with Archer Tongue, director of the International Bureau Against Alcoholism, the Handbook of Organizations for Research on Alcohol and Alcoholism Problems. The book, the first systematic collation of international organizations involved in alcoholism research, is considered by many a benchmark to measure the rapid research expansion of the past 20 years. “Although the international cooperation is well established today,” states Pittman, “one must be aware that there are strong international tensions involved in alcohol control policies.”

In 1965, Pittman served as an alcoholism consultant on two presidential commissions appointed by Lyndon Johnson. He prepared a position paper on the public drunkenness offense that later generated funding for the first detoxification center for chronic drunkenness offenders in North America. Many of his recommendations to the commissions were adopted as national policy. Experts from around the world visited the center, established by Washington’s Social Science Institute, the St. Louis Police Department, and St. Mary’s Infirmary, located on St. Mary’s grounds.

Three years later, Pittman chaired the

Shaping National Policy

In the early 1960s, the nation was witnessing a ground swell of interest in alcoholism control that surged to the federal level during the Johnson administration. From 1965 to 1967, David Pittman served as a consultant to the Task Force on Drunkenness of the President's Commission on Law Enforcement and Administration of Justice. Considered bold and imaginative for the times, the comprehensive program Pittman outlined for handling public intoxication cases helped shape local, state, and national policy. Many of his recommendations listed below became part of the First Federal Alcoholism Act in 1970 and subsequent renewals of the Act. They are excerpted from his paper on “Public Intoxication and the Alcoholic Offender in American Society” (U.S. Government Printing Office, Washington: 1967), presented to the task force in 1966.

Routine Medical Evaluation of All Individuals Suspected of Intoxication and Taken into Custody by the Police.

Routine Training of Police Officers in Handling Public Intoxication Cases.

Repeal of Drunkenness Statutes.

Establishment of Detoxification Stations (Sobering-up Stations).

Communities Will Need to Develop Effective Referral Systems for Alcoholics from the Detoxification Stations to Other Community Resources for Treating Alcoholics.

Alcoholism Treatment Programs Should Be Created and/or Strengthened in the Nation's Correctional Institutions.

Probation and Parole Services Should Incorporate Special Treatment Services for Alcoholic Offenders.

Proposed Federal Action in the Area of Alcoholism Control.
28th International Congress on Alcoholism, which marked the largest gathering of research scientists in the field and signified that the scientific study of alcohol issues had come of age.

Under the guidance of Pittman and social worker Laura Root, M.S.W.'60, Washington University launched a national alcoholism training program for professionals in 1969. “St. Louis was the mecca for advanced techniques for treating alcoholics and working with skid-row alcoholics,” Pittman says. But the fame diminished after a decade. “The federal government has undercut all of these programs during the Reagan-Bush years by not providing adequate funds for treatment of low-income individuals in general and uninsured alcoholics in particular,” he adds. While alcohol and drug treatment centers proliferate today for the medically insured, “the uninsured still receive treatment for their disease on a hit-or-miss basis.”

Nevertheless, Pittman continues his important work around the world. Chief among his many editorial and organizational activities is his committee membership in the International Council on Alcohol and Addictions and in American national, state, and local substance abuse organizations. He is past president of the North American Association of Alcoholism Programs.

At age 62, he is both pleased with his accomplishments and frustrated by society’s slow progress. “No other Western industrialized nation has so much urban poverty, violence, crime, and alienation,” he says. “Yet, we have moved away from trying to grapple with major social problems in this society. Instead of attacking alcohol itself as the offending agent, we need to ask ourselves, ‘What is it about our society that creates such an insatiable need for drugs and alcohol?’”

Many Americans are joining the “new temperance movement,” which echoes its predecessor from the first decade of this century. Under this movement, the cure for alcohol-related problems is to adopt more restrictive legislation, rather than treat the causative factors and individual patients. Following that tack, Pittman says, the revolving door will continue to spin—endlessly.

Era of the Disease Model

Sociological, psychological, and medical research conducted during the 1960s was largely responsible for public acceptance of alcoholism as a disease in the 1980s. While David Pittman was contributing to sociological research, the School of Medicine began focusing on medical causes of alcoholism in the early 1960s. In 1967, the National Center for Prevention and Control of Alcoholism, at the time a new division of the National Institute of Mental Health, established at Washington University the country’s first alcohol research program.

Supported by a five-year grant of more than $1 million, the project was headed by Samuel B. Guze, M.D.'45, Spencer T. Olin Professor of Psychiatry and former vice chancellor for medical affairs. The resulting Alcohol Research Center, still directed by Guze, is now one of 11 federally funded centers in the country and recognized internationally for research establishing that alcoholism is a genetically transmitted disease.

“The era of the disease model of alcoholism dawned when physicians began to get interested in why some people drink to excess,” Guze explains. “Although the notion of disease is very broad and vague, any kind of addiction can be looked upon as a disease. You can also substitute the word ‘disorder’ or ‘condition’ for disease.”

Regardless of the label attached to alcoholism, Guze says, the patient must first confront and accept the fact that he or she has a problem and learn as much as possible about the condition. In the meantime, researchers are looking to science — to neurobiological events, genetics, and epidemiology — for the causes of and cures for alcoholism.
C. Robert Cloninger, M.D.'70, professor of psychiatry and genetics and head of the Department of Psychiatry, is world-renowned for his studies of links between personality traits and alcoholism, especially studies of adopted children of alcoholics in Sweden and their biological parents. Cloninger's findings reveal that genes influence personality because they influence the production in the brain of neurotransmitters, such as dopamine and serotonin, which carry signals between brain cells and brain regions.

Cloninger has delineated two profiles for alcoholics. Type 1 alcoholics are eager to please others, anxious, inhibited, and rigid. These individuals—often women who drink to relieve anxiety—develop their addictions during late adulthood, although they begin drinking earlier in socially acceptable settings. One fourth of alcoholics are Type 2 — people who are extremely impulsive and exploratory, risk-taking and uninhibited, and independently self-willed and socially detached. Type 2 alcoholics begin drinking during adolescence or early adulthood and are almost exclusively men.

Neuropharmacologist Theodore J. Cicero, professor in the Department of Psychiatry, is another member of the medical school's research team. Cicero has found that alcohol significantly suppresses testosterone levels in male alcoholics and affects reproductive function through the pituitary gland and the hypothalamus. His findings help explain alcohol feminization, a frequent condition in male alcoholics, exhibited through a loss of sexual drive and a marked change in breast and/or gonad size.

Cicero recently directed a study suggesting that fathers who drink heavily prior to the conception of their children may produce long-term toxic effects in their offspring. Fathers who drink heavily prior to the conception of their children may produce long-term toxic effects in their offspring.

Lee N. Robins, professor of sociology and psychiatry, is one of the researchers credited with developing the Diagnostic Interview Schedule, a tool used worldwide to assess alcoholism and other disorders. Her joint appointment in sociology and psychiatry places her in a strategic position to study alcoholism from the perspectives of both disciplines.

"There are many links between biological and survey research," she says. "One of the interesting issues is the business of tolerance: The more you drink, the more you can drink. Put another way, you can only drink large quantities if you develop tolerance, which is another symptom."

Robins points to a link between alcoholism and other disorders, emphasizing the tragedy of substance abuse programs that ignore the other problems. "Almost everybody who comes for treatment has more than one disorder," she stresses.

According to the latest government statistics, at least 10 million Americans are addicted to alcohol; another survey shows that one in three adult Americans claims his family has been adversely affected by alcohol abuse. Linda Sunshine and John W. Wright, authors of The 100 Best Treatment Centers for Alcoholism and Drug Abuse (1988, Avon Books), point to the "very real human tragedy these figures only imply."

"Approximately one half of the traffic accidents in the United States are directly related to alcohol abuse, including 15,000 deaths a year and, yes, we should be aware that our national health bill is significantly higher because families of addicts and alcoholics require twice the amount of medical services," they write.

"But missing in this maze of facts and figures are the stories of lost hopes and promises, of broken homes, child abuse and wife beating, of degradation and public humiliation that are the true record of so many families of the chemically dependent."
During the 24 years that I have been engaged in advancement work, Americans are reported to have made charitable gifts and bequests totaling $1,061.08 billion—well over a trillion dollars. Of this amount, $111.83 billion went to educational institutions—just a little over 10 percent. Of that 10 percent of total charitable giving, Washington University, to date, has received more than $920 million, or approximately .8 percent of all giving to all levels of education.

Although Washington University has done very well in attracting gift support, neither it nor the entire American educational establishment has received a major share of the philanthropic dollar.

American giving since 1965 has increased 607 percent, from $14.76 billion in 1965 to $104.37 billion in 1988 (the last year for which this information has been reported); gifts to education rose 387 percent from $2.01 billion to $9.78 billion. Obviously, much remains to be done to enhance the educational sector of philanthropy.

It is interesting to me, and I hope to others, to look back over this period to see what has changed, what has remained the same, and what the prospects are for the future.

Both the record of total philanthropic giving over the past quarter of a century and the experience at Washington University serve to expose two myths that keep recurring in discussions of gift support. One is that giving fluctuates with the Dow Jones and the leading economic indicators. Actually, short of total economic collapse, there seems to be no way to keep Americans from giving. In fact, total giving has increased every year, regardless of recessions, and corporate giving has shown slow but steady gains over the years, with the exception of a slight retreat in 1970 and 1971.

The second myth is that changes in the tax laws have a critical effect on giving. These laws exist to help people do more for philanthropic institutions serving the good of society than they could do otherwise. The laws are not set up to help people evade taxes. It costs people money to give; even when the laws have been changed in a restrictive way, more people have still given more money.

In the United States, fund-raising activities have been ongoing since the 1640s. Procedures have been refined and formalized. After World War I, they evolved into the large national fund-raising campaigns well known to most of us. The idea was to enlist large groups of volunteers in behalf of worthy causes and to provide them with a rational statement explaining the purposes for which funds were sought,
Washington University’s advancement costs of from 14 to 15 cents per gift dollar raised have remained consistently among the lowest in the nation.

together with the organizational aids they needed to solicit their peers for support. Experience in such campaigns showed that most men and women responded generously and that their generosity was in direct relation to their degree of involvement with the particular institution. Not surprisingly, the volunteer workers often proved to be the best givers and the most effective volunteers were those who had a close relationship to institutional planning and decision making.

This approach to fund-raising does not seek gifts through pressure tactics (most people with money to give are fully capable of resisting pressure) or gimmicks. Rather, it seeks to assist the charitably inclined individual to make intelligent decisions.

When I went to work for the University, its “Seventy by Seventy” campaign was getting under way, and an enormous amount of literature was at hand — much of it already outdated. It told why Washington University was a good institution and why its services to the community and the nation were important. It called for an infusion of $70 million by 1970 to strengthen those services. And, indeed, the money was forthcoming. By mobilizing a volunteer group for the first time and encouraging personal calls on alumni and friends, we passed our financial target a year ahead of schedule.

The amount expended on campaign literature for the Seventy by Seventy program is not known, but I know exactly what we spent when the next campaign was launched in 1973. We spent $87! This was the total cost of reproducing a typescript statement about our objectives and the rationale for them for our $120 million campaign. This must have been one of the most unusual case statements ever presented by a University to its constituencies.

The fact was, however, that we had been working very hard at building a comprehensive development and public relations program to gain understanding and support. We were doing all those fundamental things that all institutions ought to be doing at all times in their ongoing advancement programs.

The $120 million campaign goal was met in three years — two years ahead of schedule. During those three years, 24,370 donors contributed to the University compared with 15,594 during the four years of the Seventy by Seventy program, a 56 percent increase. Our alumni volunteer corps grew from about 200 in the early 1970s to some 2,500. Gifts during the decade totaled $231.8 million, up 153 percent over the previous decade. In fiscal 1970, 7,500 donors made 10,963 gifts. In fiscal 1979, 19,256 donors made 22,762 gifts.

To my mind, this matter of continually expanding the base of participation in the development program is of the utmost importance whether you are a school with tens of thousands of alumni or an organization with a much smaller constituency. Working with a broad constituency is not as cost-effective as going to a few prospects with large resources, but it is a vital investment in the institution’s future. We must keep faith with today’s generous donors by cultivating tomorrow’s supporting constituencies.

Between the mid-1960s and the present, our alumni program grew from zero alumni chapters to 34 nationwide, plus two overseas (Hong Kong and Tokyo). Our volunteer corps increased to over 5,500 individuals. During the same period, alumni giving rose from approximately $600,000 to $10.8 million in 1989. The percentage of participation in annual support has risen from 10 percent to 29.9 percent, with alumni of individual schools attaining participation records as high as 42 percent. Total giving to Washington University rose from the $5 to $6 million range to $50 million, a tenfold increase.

Our progress in putting into place and implementing a greatly expanded volunteer organization was not the result of doing anything other institutions had not done. We just went to work in a very intensive way and succeeded.

In the late 1970s, however, we set forth in an untested area. I had long thought that top volunteers would be willing to give much more of their time and expertise if the assignment were really interesting and challenging.

Our plan was to invite a broad spectrum
Great expectations:

Beginning in June 1979, the 10 task forces of the commission met 54 times with deans, faculty, and students. Their reports totaled over 520 pages and provided the basis for our $300 million ALLIANCE Campaign launched in the spring of 1983. The campaign, which achieved its $300 million goal 18 months ahead of time, continued until its scheduled completion date of December 31, 1987, and ultimately raised $630.5 million thanks to the generosity of 60,752 donors including the Danforth Foundation.

In short, we turned the case statement process around. Instead of preparing such a document and bringing it to our constituencies, we enlisted their help in writing it for us. There is no question that the resulting plan was sounder and more challenging than what we might have produced internally. As a result of going through this process, we had a corps of
A Career Dedicated to
Washington's Future

Herbert F. Hitzeman, Jr., senior vice chancellor for university relations, will retire as Washington University's chief advancement officer on June 30, 1990.

Hitzeman joined the development staff in 1966, was named director of development in 1969, and was given responsibility for all of the University's advancement activities in 1975. Since 1968, he has guided the University through three major development campaigns, with progressively higher goals; the most recent was the most successful in the history of American philanthropy. Under his direction, Washington University's visibility increased significantly nationwide.

Chancellor William H. Danforth said, "The role Herb Hitzeman has played during the past 24 years in shaping the future and the national image of Washington University is immeasurable. As a result, an enduring alliance of the entire Washington University family has been built and nurtured. Yearly giving totals have increased more than tenfold, and Washington University has grown in stature and in reputation.

"To say he will be missed is insufficient to describe what his efforts have meant in securing support for literally thousands of student scholarship recipients, for our faculty, for our teaching and research programs, and for major building projects. Without Herb Hitzeman, Washington University would be a lesser institution," Danforth added.

Hitzeman planned and directed the ALLIANCE FOR WASHINGTON UNIVERSITY, a campaign publicly launched in 1983 with a goal of $300 million. The University's alumni and friends responded generously; a record 233,115 gifts were received from 60,752 donors. When the campaign was completed in 1987, the total of $630.5 million in gifts and commitments was more than twice the original goal.

Originally hired to staff the University's Seventy by 'Seventy program, Hitzeman was named director of the campaign in 1968 after successfully heading the medical and dental alumni phases. The $70 million goal was reached a year ahead of schedule in 1969.

Named director of development at that time, he was promoted a year later to associate vice chancellor. A second major campaign was launched under his direction in 1973, with a goal of $120 million in five years. That campaign was completed in 1976, two years ahead of schedule. In 1975, as vice chancellor for university relations, he was given responsibility for the University's public relations program, in addition to the development and alumni programs. He was promoted to senior vice chancellor for university relations in 1983.

"Support from alumni, parents, corporations and foundations, and other friends of the University has risen dramatically — testimony that Washington University is a major asset to the St. Louis community and the nation," Danforth noted. "We have Herb Hitzeman to thank for expertly guiding us through a series of wonderfully successful endeavors, including the Commission on the Future of Washington University, the national councils, and a national and international alumni organization, all of which have helped build a strong corps of friends and volunteers."

A 1953 graduate of Washington University, Hitzeman worked in advertising, marketing, and construction contracting before joining the University administration. He and his wife, Jane, M.A.Ed.'72, have a son, John. Hitzeman's retirement plans include travel, sailing, and pursuing personal interests in the St. Louis area.
volunteers who knew Washington University in depth and were committed to the enterprise. It wasn't just our plan, it was theirs. No wonder the subsequent success of the campaign, which we called the ALLIANCE FOR WASHINGTON UNIVERSITY, was beyond anyone's expectations.

In recognition of the key role the commission played in our institutional planning, we have now created a permanent structure of national councils for each of the University's nine major academic units and the library and student affairs areas. In addition to functioning as advisory bodies to the deans, these groups interpret the schools' programs to others and enlist volunteer leadership and private support in behalf of these programs.

People who have been allowed to participate in getting to know an institution often give whether they find that institution a paragon of excellence or not. They give because they have come to understand the institution's potential for service. They have been made part of the promise.

One of our greatest satisfactions is having volunteers tell us how much they enjoyed their work and what it has meant to them to be of help.

These basic principles are little affected by new techniques and technologies. The computer helps make record-keeping more effective, and new technologies speed the transfer of information, but these are merely tools. Where technology has had its greatest impact has been in the field of public information. Here, many institutions have lagged behind. We did for a time. But in the last 15 years, since public relations has been part of the University's overall advancement program, we have made a major effort to communicate the Washington University story to a national and international audience. Today you cannot carry on an effective public relations program by just mailing out press releases, nor can you ignore the fact that more people get their news via television and radio than from the printed word.

Public relations is much more than getting items into the area media. Institutions today must define their constituencies and determine the appropriate means of informing them. This may be one of the areas in which we shall see the greatest changes in the days ahead.

Washington University's advancement costs of from 14 to 15 cents per gift dollar raised have remained consistently among the lowest in the nation. These costs include all expenses for alumni programs and fund-raising, development, public relations, record-keeping, gift processing, and other special projects.

A recent national study of such costs at a cross section of American colleges and universities shows advancement costs at other institutions ranging from 15 to 41 cents per dollar raised with a median cost of 20 cents. The ratio at Washington University prevailed throughout our most recent campaign, which involved no extra budget or staff. In fact, our "campaigns" have simply been periods of intensified effort within the context of our long-term development program. They have not parted from the basic principles of ongoing development work.

I believe the evidence has shown that Americans are concerned about others and are willing to provide resources for purposes believed to be useful. There are two avenues through which funds can be channelled to this end. One is simple, the other complex.

The simple avenue is known as taxation. Of course, good citizens pay their taxes, but a strong element of fear is introduced as an added inducement. The other, or more complex approach, involves the application of the fundamental principles of advancement, principles which build mutual respect between worthwhile institutions and their constituencies as an alternative method of working for a better world. The merits of this approach, relative to the other, are immediately discernible.

I am grateful for the opportunity to participate in the American phenomenon of philanthropy and especially as a part of Washington University. I thank all who have shared in this marvelous undertaking, and I commend future generations to build upon the wisdom and generosity of those of the present and the past.
**Developer Mark Mason**

**Gives Rise to the Spirit of Volunteerism**

Mark Mason, A.B.'51, ended up at Washington University by luck. As a high school student in Brookline, Massachusetts, experiencing his first real bout of wanderlust, he applied to, and was accepted by, such schools as the University of Southern California, the University of Oklahoma, and Washington. He quickly settled on USC, the farthest from home, as his first choice.

"I had a desire to go far afield," he says. "But my mother was recently widowed, and California was too far away for me to travel back and forth for vacations. So I compromised—I only went halfway across the country."

The compromise worked out well. Mark has fond memories of his professors at Washington, but it was his overall experience that made a lasting impression and carried over into his life and career: "It helped give me confidence and self-assurance," he says. "St. Louis was a friendly city. The size of the campus was ideal, small enough to get to know most of the students. The out-of-town students were especially close, since at that time only about 25 percent of us were from outside St. Louis."

In downtown Pittsburgh, his 45th-floor office at One Oxford Centre evokes the American Southwest: woven rugs, cactus plants, Indian pottery. The panorama of the Golden Triangle from atop the city's third tallest corporate tower is spectacular. In a lighted niche near his desk sits a distinctive ceramic pitcher—a woman's face on a rounded shape, with three legs ending in bulbous feet. A Picasso. It recalls a moment nearly four decades earlier: "I was sitting in my art history class, thinking how nice it would be to own and treasure a de Chirico." Mark has remained an admiring student of art in its many forms. His personal collection contains Impressionist and Post-Impressionist works, metaphysical and surrealist art, and the works of young, contemporary artists.

Mark and his wife, Myrna, find folk art and native crafts on treks to such exotic places as Papua New Guinea and the Amazon basin—he still has the wanderlust. Mark's active role in local, state, and national politics earned him inclusion in a group of businessmen who met last year in Pittsburgh with Prince Hassan, King Hussein's brother. In return, Hassan invited them to Jordan as guests of the royal household to discuss economic and trade issues and possible solutions to Middle Eastern conflicts. Earlier this year, Mark and Myrna traveled to Borneo, Sulawesi, and Japan, where they visited their daughter in Tokyo.

After his graduation in 1951, Mark lost touch with Washington
alumni put Mark on the Alumni Board of Governors, and he’s remained a leader in national alumni affairs for Washington University since. He was the first alumnus residing outside St. Louis to serve as chairman of the alumni board. Commuting from Pittsburgh to St. Louis to preside at board and committee meetings and other events several times a year proved a strong test of his commitment. A Distinguished Alumni Award in 1979 honored his loyal service.

* "The Washington experience helped give me confidence and self-assurance." *

Mark says he felt he was really having an impact when he served on the Student Life Task Force of the Commission on the Future of Washington University in 1979-81. “We discussed issues concerning dorms, the food service, campus security, and the athletic facilities with students, staff, and faculty,” he says. “It was a thrill for me to see the plans come together.”

Mark has helped bring those plans to fruition with monetary support as well as volunteer service. He has been an Annual Fund giving club member continuously since 1971. He significantly increased his annual support in 1983 through an early pledge to the ALLIANCE FOR WASHINGTON UNIVERSITY; he and Myrna were charter Patrons of the Eliot Society, the highest category of annual giving. He continues to support both Arts and Sciences and the John M. Olin School of Business.

The Masons’ most recent major commitment provides generous support for the Center in Law, Business, and Economics—an interdisciplinary center that is a key part of the Olin School’s plans for achieving national distinction—and for the renovation of Ridgley Hall, home of several departments in Arts and Sciences. A portion of the pledge will take the form of challenge grants to alumni and friends of the business school and Arts and Sciences to help their schools earn the grant with Annual Fund gifts.

Mark has kept involved in University planning, first on the Student Affairs National Council, currently on the Arts and Sciences National Council. He encourages other alumni, and students, to support a growing tradition of academic excellence. Mark says, “One of the things of which I’m most proud is that Washington University is a stay-in-touch university. Through working for the University, I’ve gotten to know the staff, the deans, and especially Bill Danforth, who’s dedicated himself completely to the welfare of Washington University.”

Last October, for only the second time in 20 years, Mark missed the Founder’s Day. A member of the board of Lincoln Savings Bank in Pittsburgh and the central advisory board of the Arkwright Insurance Company, a life trustee of the American Jewish Committee-Pittsburgh chapter, and active in many other organizations, Mark allowed that only one thing could make him miss the annual awards banquet: a conflict with his other major cause. He is a member of the national board of trustees of the Leukemia Society of America, which held a working conference the same weekend.

If Mark Mason said no to Washington University, you know he had to have a good reason. It just hardly ever happens.
The Berlin Wall: “An Experiment in Governing Gone Terribly Wrong”

Germany’s postwar history is determined by three dates: June 17, 1953, the people’s uprising against a hated regime; August 13, 1961, the building of the Wall; and November 9, 1989, the toppling of this monument to 40 years of an experiment in governing gone terribly wrong. From this date forward, the years will be divided into a different “before and after”—there is no turning back of the clock.

With this new sense of time comes a new sense of space and place. The areas that had fallen silent in the shadow of the Wall, so called Zonenrandgebiete, suddenly appear at the center of attention and activity. Clamoring with new life are streets and roads, which in Berlin and elsewhere along the border had ended abruptly, disappearing under the weeds that had reclaimed prewar asphalt, undisturbed by foot or by wheel.

These recent events were borne of a new sense of confidence to do what must be done. History has broken into the everyday life of every German with the realization that for the first time since 1933, neither part of Germany is governed by a totalitarian regime. The credit for this fortunate turn of events goes to the allied powers, who defeated Hitler, to Gorbachev, who has become the patron saint of this new age, and to the people of the GDR, who had the courage to march at a time when Tiananmen Square was still fresh in everyone’s mind.

The founding of the GDR had started full of hope in 1949 when East Germany established itself as a sovereign state with its own flag, money, military, government. This new state had tried to separate itself from the past so totally that it denied any kind of historical continuity that might have tied it to Hitler’s Reich. It claimed as its heritage the socialist and communist tradition of the late nineteenth and early twentieth centuries when it invoked the names of its heroes Ernst Thälmann, Rosa Luxemburg, Klara Zetkin, and Karl Liebknecht. The ideals of these forbearers would serve as the guiding lights for the new nation, but not for the governing party nor for the men and women who assumed political power.

In the dark shadow of Stalin’s ideology, the lights of the guiding ideals of socialism and democracy were soon dimmed. The great expectations of this small nation, which had to wait until the early seventies before its prospering brothers and sisters in the West officially recognized its existence, were soon reduced to small hopes. No economic recovery brought new pride to its people; no new freedom led to democratic principles. The new state denied freedom of expression, freedom of scientific inquiry, freedom of study, freedom of movement, freedom to choose one’s career.

It created two societies. Those considered privileged could get most everything they wished in special stores for hard currency and could command apartments, houses, and cars. The rest had to stand in line for all necessities and for small luxuries.

The state, which at its paternalistic best provided jobs and social services, basic foods, and shelter, also tried to meddle in all facets of one’s life. As a result, the people began to live their lives in such a way that the state had no room nor reason to interfere. Young people married early and quickly and had several children. This status guaranteed preferred treatment in the search for an apartment and enabled young people to move away from their parents. The more children, the more preferred treatments. Abkindern it is called, an expression virtually untranslatable.

Censorship never really abated; reading materials were exchanged, as were services and word of the newest shipment of whatever commodity was coming to town. At home the radio, and later the TV, was permanently tuned to Western stations to which one listened faithfully. Religion, too, became important to the point that the

Finally, the steel-concrete building blocks, impenetrable to machine gun, bomb, or tank, were capped with a rounded hood, streamlined, and whitewashed so that no human hand or foot could cling to them.

weekly services of Thanksgiving at the Leipzig Nikolai-Church emerged a symbol of a quiet insistence that the state begin to live up to the promises made in its constitution and in its treaties with the Federal Republic, of the so-called Ostvertrag of 1971.

The harsh, joyless life, the political and spiritual oppression reached their first climax in the uprising of the 17th of June 1953. The citizens of Berlin and the other cities that followed attempted to overthrow the hated regime. They had listened too eagerly to Western broadcasts and had believed too naively that their plight would move the allies to intervene. We know now
that no such intervention was planned, and none could have been attempted without the risk of a new war. But for two days the order seemed broken: Kids did not go to school; teachers cried in the halls; rumors of the Americans coming, the Russians coming, the government falling, kept adults huddled together at their radios in the hope that they also might soon be free like their prospering cousins in the West. The tanks were formidable when they rolled into the towns. Sidewalks become very small and the was laid in this crazy exercise in containment. Leaving then, as now, were the young, most valuable members of the population. They went west to become a part of the economic miracle, to escape the ever-present controlling eye of the state, to live the good life, to “get out.” West Germany welcomed them gladly, for its booming economy's need for workers was insatiable. Those remaining disappeared behind the wall, which grew ever more formidable. It was first constructed out of simple hollow building blocks diverted from apartment building sites — no match for bombs or charging trucks. The second incarnation replaced the blocks with concrete. The third round of wall building saw the production of prefabricated sections, testifying to the ingenuity of engineers and builders. Finally, the steel-concrete building blocks, impenetrable to machine gun, bomb, or tank, were capped with a rounded hood, streamlined, and whitewashed so that no human hand or foot could cling to them.

Behind the wall, arranged in neat, precisely measured rows, the barbed wire, the mine strips, the dog runs, the watchtowers divided the country, cutting through houses, streets, fields, woods, and lives. At first a silent symbol of the state's hubris, it soon became the writing tablet of a generation, a Gesamtkunstwerk, consecrated by the blood of those who lost their lives because they refused to live in a state that would not let them breathe.

While the wall remained an impenetrable monolith, the world around it changed, and the unexpected happened — a breach was cut in the wall, and people began to stream out. The frightening spectacle of this small country losing its most valuable people—its young, best educated, best trained, its future—alarmed those who stayed behind and urged them on to new, internal activism.

The Monday evening crowds around the Nikolai Church swelled to 300,000. Courage grew, as did the numbers of those who braved the danger and the cold in their silent march around the Leipzig city center, a march without song, slogan, and speeches, described as a powerful experience by those who were part of it. And powerful it was. It led to the collapse of a wall and a government. It gave new life to new politics and new hope to those who had stayed and to those who had left and who might now return.

— Gerhild Scholz Williams

A native of Perleberg, East Germany, Professor Williams is associate provost of the University and chair of the Department of Germanic Languages and Literatures. This commentary was extracted from a paper delivered at the colloquium “Tears in the Curtain: Recent Developments in East and West Germany,” presented at Washington University December 4, 1989, by the Department of Germanic Languages and Literatures and the Western European Studies Program.
Model image: The red frame structure in this three-dimensional computer-aided image of downtown St. Louis was created by Faisel Mazi, a graduate student in the School of Architecture. It is modeled after one of architect Bernard Tschumi’s follies currently under construction in Paris’ Parc de la Villette. Mazi and other students in computer-aided design courses are encouraged to explore the potential of media technologies through exercises such as this one. The software HOKDraw and HOKImage were used to create the picture. The final ray-trace processing and printing were performed by Synchronic System, Inc., of St. Louis, with an IRIS ink jet printer that produces 1,200 dots per square inch.