Halley's Comet • Surprise in the Sky
Celebrate

This issue accents sports and athletes at Washington University. Kathy Fagan, a senior in occupational therapy from Indianapolis, displays this renewed vigor in sports at Washington University. She's one of several athletes, both varsity and intramural, we interviewed for Washington University Magazine and exemplifies the new winning athletic spirit found at the University.

"I'll be sitting in a class and I will see myself playing tennis or I will see myself playing basketball," she says. "So, I'll see myself hitting that shot and getting there and stepping into the ball and hitting it. Or I'll see myself getting into position in basketball and following through on that jump shot and seeing the ball go through the basket. Or I'll see myself passing the ball to somebody who's open or moving to get open."

The new athlete at Washington University is just one reason to celebrate. The University has a vast new athletic complex that promises to inspire this era of top-notch athletes.

Two other events require celebration as well. The University celebrated the 150th anniversary of Mark Twain's birth in October titled "Mark Twain: An American Call to Literature." In this issue, Professor-emeritus Guy Cardwell does some bursting of the myths surrounding Twain's life and art.

"I came in with Halley's comet in 1835," Twain said. "It is coming again next year and I expect to go out with it." His death on April 21, 1910, came one day after Halley's comet circled the sun.

Since the comet and the writer's existences intertwined, it seemed fitting that the magazine cover one's return and celebrate the other. Halley's comet will visit earth soon, although many predict it will not be as spectacular as its last visit in 1910. In this issue, an alumnus and faculty member talk about Halley's significance to our universe.

By the way, since space and extra-terrestrial bodies are an important part of this issue, credit should be given to alumnus Roger A. Keen, who photographed the moon for the article "No Plans for Retirement" about the University's telescope that appeared in the winter 1985 issue.

If this issue has any one theme, then, it must be "celebration." Celebrate with us.

B.N.
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These student athletes have it, and they talk about what it means to them to be winners in sports and academics.

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A chemical called t-PA has been shown to dissolve those life-threatening blood clots blocking a coronary artery.

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That fire in the sky is returning and a Washington University alumnus and a faculty member are in the thick of things exploring what these balls of ice mean to the origin of the universe.

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Professor emeritus Guy Cardwell discusses the myth behind Mark Twain, the righteous symbol of America, and pops a few bubbles along the way.

Six Steps for Puncturing a Ballooning Deficit
Professor Murray Weidenbaum gives his viewpoint on the agony and ecstasy of trying to cut the federal budget.

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Rolling on the River

More than 1,000 WU freshman and transfer students were initiated into Washington University and the St. Louis community on board the Mississippi Riverboat “The President” recently. The students went aboard to meet Chancellor and Mrs. William H. Danforth and other members of the University community. The cruise took the place of Danforth’s traditional ice cream social to help new students learn to feel at home in the St. Louis area, which surrounds the WU campus.

Faith Maddy, assistant director for orientation and student programs, says the floating orientation was designed to emphasize the importance of the St. Louis community as part of the undergraduate learning experience. “St. Louis has an interesting history, as well as many important attractions including Forest Park, the theaters, Shaw’s Garden, and the botanical garden,” Maddy says. “We want new students to make the surrounding community an important part of their learning experience.”

The orientation effort is part of a push to integrate WU students into the metropolitan community. The week-long orientation program also included an address by St. Louis Mayor Vincent Schoemehl.

During the three-hour cruise, students enjoyed desserts and soft drinks as they talked with Chancellor and Mrs. Danforth, faculty members, WU personnel, and student leaders. The Bob Kuban Dance Band provided a variety of music, including St. Louis jazz. The incoming students also had plenty of opportunity to relax on the deck of the boat and watch St. Louis float by.

The Campus in Photos

For the first time, Washington University alumni and friends may purchase a hardcover photographic essay of campus. The book, titled Washington: A University Portrait, includes lush photographs of the campus and commentary by Pulitzer Prize winners William Strode, the photographer, and Howard Nemerov, poet and faculty member.

“It fills a need that we’ve known existed for a long time,” says Director of Campus Bookstores Paul Scheffel of the publication. Scheffel recalls that numerous requests for a publication of this kind had prompted him to commission the book. He contacted the Fort Church Company of Little Compton, Rhode Island, a company that had published similar books for other universities including Harvard.

“They assigned William Strode as our photographer,” says Scheffel. “We wanted someone who would represent the physical aspects of the campus as well as the atmosphere here,” he explains. Strode began photographing at the 1984 commencement and eventually submitted more than 4,000 photos. About 100 were selected for inclusion in the book.

“We then contacted Howard Nemerov, a person whom we thought could set a mood for the book, to provide commentary on the photos,” Scheffel continued. The book was first available in the bookstore in early September.
Diabetes Research Offers Hope

Clusters of insulin-generating cells, called islets, transplanted from cadaver pancreases to diabetes patients temporarily produced detectable levels of insulin in three of the six patients treated, researchers from WU reported at the American Diabetes Association's 45th Annual Scientific Sessions.

A seventh patient, who became diabetic when her pancreas was removed because of pancreatitis, received a transplant of cells harvested from her own pancreas. Researchers say she has shown the longest-lasting insulin production of all those tested to date.

"The transplanted cells set up shop and produced insulin at least temporarily in four of the seven patients treated," said David Scharp, M.D., associate professor of surgery who performed the operations at Barnes Hospital.

"None of the patients had graft production sufficient enough to completely eliminate the need for insulin injections, but there was significant insulin production in the four patients who responded. Insulin generation lasted from three-to-12 weeks and decreased the patients' dependence on injected insulin by as much as 50 to 90 percent."

More than two million Americans have insulin-dependent diabetes. The disease commonly begins during childhood or adolescence and is usually caused when insulin-producing cells—clustered in the pancreas' "islets of Langerhans"—fail to release enough insulin to properly regulate carbohydrate and glucose metabolism. Islet cell transplants are an experimental approach to re-establishing a diabetic's own efficient, autoregulated supply of insulin.

"We are pleased with the yield of our islet isolation procedure," said Paul Lacy, M.D., Ph.D., Robert L. Kroc Professor of pathology who directed the development of the islet-harvest process at WU. "We have been able to consistently isolate 200,000 islets—about 40 percent of the pancreas' insulin-producing mass—from each healthy, well-preserved cadaver pancreas we have received. The samples transplanted were pure enough that none of our patients exhibited a toxic response to the islet preparation.

"From this point," added Lacy, "with confidence in the low risk to patients and the yield of the isolation process, we can now focus on why the transplants produced insulin only temporarily."

The six patients who received donor pancreas transplants (allografts) are adults with insulin-dependent diabetes who had no detectable insulin production before islet transplantation. Each of these six patients had previously received a kidney transplant and was taking antirejection medication (immunosuppression) to avoid kidney rejection. All allografts consisted of at least 200,000 islets suspended in a diluting fluid and injected into the recipient's spleen. Lacy's and Scharp's previously conducted animal studies indicated that the spleen would be a suitable and safe site to deposit the transplanted tissue. Previous studies also indicated the spleen would require more islets than the liver, another site considered for islet graft location.

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Gift Establishes Chair

William R. Stuckenberg of St. Louis has endowed the Stuckenberg Chair of Human Values and Moral Development in the Department of Psychology. Chancellor William H. Danforth announced. Jane Loevinger, professor of psychology, has been named to the Stuckenberg Chair. Her research interest is in ego development and patterns of moral development.

Founder of his own construction and residential property management company, Stuckenberg is a 1924 graduate of the Washington University School of Engineering. His gift is part of the $300 million campaign, the ALLIANCE FOR WASHINGTON UNIVERSITY.

Chancellor Danforth said, "This Chair is a wonderful example of an inquiring mind—Bill Stuckenberg—realizing the value of scholarship and research in understanding how we humans develop our values. And, it is most fitting that a highly respected member of our faculty who shares Mr. Stuckenberg's concerns—Jane Loevinger—be the first occupant of the Stuckenberg Chair."

"I hope that attention brought to Professor Loevinger and this professorship will encourage students, alumni, and friends of the University to recognize how essential the study of human relations and development really is," says Stuckenberg.

Paul Lacy (left) and David Scharp (right) engineered insulin-producing cells.
Below is a smattering of quotes from some of the famous people who visited campus this year. They're the company we keep.

**NATALIE DAVIS**
Professor of History, Princeton University
September 26, 1984
Fall Honors Assembly
“From Alms to Bribes: The Gift in Sixteenth Century France”
“But what a harmony when each person lends and each person owes!”

**MORTON KONDRACKE**
Executive editor, The New Republic
October 17, 1984
“The Reagan Presidency: How it Works and Doesn’t”
“Washington has become the official home of the oxymoron.”

**JUANITA KREPS**
Secretary of Commerce under President Carter
October 31, 1984
Tenth Annual Mr. and Mrs. Spencer T. Olin Conference
“From Access to Ascent: and a supreme court justice; but no ERA.”

**WILLIAM LEAST HEAT MOON**
author: Blue Highways: A Journey into America
February 13, 1985
Cultural Week Celebration
“Why do you get up in the morning and pull on your socks? That’s the question behind every question in Blue Highways.”

**BENJAMIN L. HOOKS**
Executive Director, National Association for the Advancement of Colored People
April 3, 1985
Fifteenth Annual Martin Luther King, Jr. Symposium
“Outlook for the Minorities in the ’80s”
“I believe that the vote is the most potent weapon that any people have.”

**HANNA GRAY**
President, University of Chicago
May 16, 1985
Eliot Honors Assembly
“On the Vocation of Liberal Learning”
“I think that there is a relationship between thinking hysterically and analyzing the very compli-
cated questions of the past and future.”

**PHILIP HABIB**
former United States diplomat
May 17, 1985
124th Commencement Exercise
“Mixed with your ideals, you may sometimes suffer from cynicism, but how can youth be pessimistic? It’s inconceivable to me.”

**JEREMY POSTAER**
Washington University, Bachelor of Fine Arts, 1985
Student Commencement Speaker
May 17, 1985
124th Annual Commencement Exercise
“The Art of Choosing”
“Washington University has inspired us, stoking our childhood sparks to a healthy blaze. I think most of us will choose wisely in its comforting warmth.”

The School of Architecture celebrated 75 years of architectural education at Washington University with a two-day conference October 25-26. The anniversary event included films, roundtable discussions, tours of both campus and St. Louis architecture, and social gatherings for School of Architecture faculty, alumni, and students.

On Friday, October 25, five of the school’s deans including current Dean Constantine Michaelides presented a luncheon program on the school’s history and on their experiences as deans. In another session on Saturday, October 26, faculty and alumni participated in a discussion of the role of education in the architectural profession.

Students currently enrolled in the School of Architecture had the opportunity to participate in several events of the celebration, including a discussion of career opportunities for architects.

The centerpiece of the celebration was an exhibition featuring the lives and work of the school’s alumni. Michaelides said the anniversary celebration attracted alumni from all over the country. “This is the first real opportunity we’ve had for an alumni reunion,” he said. “We wanted to make it both a social and a professional update.”
Opener:

EMBAs Visit Japan

Thirty-eight businessmen and women from St. Louis area companies went back to school this fall. But no single course or semester would satisfy this crew. Washington University's third Executive MBA class. In June of 1987, these mid-level managers and heads of their own companies will graduate with master's in business administration degrees.

For 21 months, commitment to that goal will mean an average of 20 hours a week spent studying and attending classes on alternative Fridays and Saturdays while continuing their full-time jobs. Not for the faint-hearted, this regimen moves its hardy band through a lockstep sequence and turns out managers better prepared to take on new responsibilities and promotions that will come to these candidates for upper ranks of management.

The class of '87 averages 37 years of age and is nearly one-fourth women. That compares with just three in WU's first Executive MBA class, which graduated June 1 in a separate commencement ceremony.

The class of '85 wasn't even in the Western Hemisphere for the University's main commencement May 17. Finishing their last course, "Management in a World Environment," the students went to Japan for a week. "We want to study operation of business in countries where we think we can learn the most," says C. William Emory, associate dean for the EMBA program in the business school. The second class also plans a Japanese trip as finale to its studies next May.

Although some future EMBA classes may elect another country, the first group's itinerary set an enviable pace. A briefing from U.S. Ambassador to Japan Mike Mansfield started off the schedule in Tokyo. There were sessions at two American corporations doing business in Japan (Bank of America and Price-Waterhouse), a huge Japanese trading company (Marubeni), other Japanese companies with significant U.S. sales (Nippon-Kokan Steel and Nissan Motors), and Dentsu, the world's largest advertising agency.

An overseas trip—to Japan or another country—isn't the only travel built into the program. At the end of the first year, each class goes to Washington, D.C. In a week's time, Emory says the students get a crash course in "understanding the processes of government, how laws are made, how influence is exerted, how administrative agencies administer."

But the core of the EMBA experience is on WU's campus, where about 20 people teach the working students during the 21-month curriculum.

Comments Business School Dean Robert L. Virgil: "We take great satisfaction in the broad support that the St. Louis business community has given our program, the only one of its kind here. Our goal is to provide this area with the highest quality Executive MBA attainable."

Picture This

WU and Digital Equipment Corp. signed an agreement to develop a computing network for both the Hilltop and Medical campuses to support advanced picture communications as well as high-speed text transmission.

A major theme of the agreement is the development of advanced professional workstations. Based on Digital's MicroVAX computer and tailored to the needs of the engineer, basic scientist, physician, and educator, the workstations will be capable of transmitting pictures as well as symbols and graphs between the University's two campuses and several academic divisions.

The partnership agreement will enable WU to acquire $15 million worth of Digital computing and networking resources at reduced cost over the next three years. In exchange, the University will provide Digital with technical expertise in using computers for education and research in a networked environment. The University also will act as a demonstration site for Digital products.

"Washington University is a national leader in computing," said Chancellor William H. Danforth. "This agreement enables us to maintain that leadership in the important area of networking and advanced workstation development. We are grateful to Digital for the opportunity to acquire this excellent equipment."
An aerial view of the new Athletic Complex: A blend of the old with the new.

We Have An
ATHLETIC
COMPLEX

By Michael Wolf

Why was Washington University selected to be the national headquarters for the 1986 AAU/USA Junior Olympic Games? The answer is its new, superb athletic facilities.

Washington University will be the site of the Games because its $13-million athletic complex is among the finest in the nation. Completed this summer, the project is the first major renovation and expansion of the University's athletic facility in more than 50 years. These will be the first major games played here since Washington University hosted the World Olympics in 1904. The new facilities are expected to be named and dedicated November 22, 1985.

"There was a sincere interest shown by the city of St. Louis, the St. Louis community, and Washington University to host the Junior Olympic Games," said John Schael, Washington University athletic director. "Despite the quality of our athletic complex, however, the ingredient that led to the choice of Washington University and St. Louis over other universities and communities was the support provided by the St. Louis Civic Entrepreneur's Organization."

It was frosting on the cake when Washington University landed the 1986 Junior Olympic Games. The University constructed the athletic complex to provide more attractive recreational and competitive sports facilities for its students, faculty, and staff. The Hilltop campus has renovated the original field house and added a recreation gymnasium, an eight-lane, 25-meter swimming pool with diving area, eight racquetball/handball courts, two squash courts, a weight room, and locker rooms.

Renovation and construction also has taken place outside with the addition of a new baseball field and several lighted fields for intramural activities. Built more than eight decades ago, the historic Francis Field stadium, site of the 1904 Olympic Games, has been refurbished with a regulation football-soccer field and a synthetic, eight-lane, 400-meter track. Field event areas have been developed within the stadium and adjacent to the playing field. The stadium now seats 3,200 fans, compared to the former figure of 7,500.

The wings of the stadium, which jutted at an angle from either end, have been demolished. Other additions include a press box with complete electronic communications systems.

The basketball Bears playing with a home-court advantage in the new Washington University Field House.
improved lighting, a concession stand and restrooms, paved entry with spectator-control fences, and practice field.

Also, the University's eight tennis courts have been repainted, with lighting added to four courts.

PLANNING AND FINANCING

Plans to build a new sports and recreation center began in 1977, when a local architectural firm was asked to do a feasibility study.

"Hastings and Chivetta did an exhaustive study on what could be done to improve our athletic facilities," said Schael. "The study was reviewed by the University, crystallized, and then organized into various phases.

"Originally, we planned construction in three phases. The first phase would have included a multipurpose building, with moderate renovation of Francis Gymnasium; the second phase would have been a swimming pool, as well as some needed indoor space; and in phase three, we would have added an additional auxiliary gym and addressed outdoor activity areas.

"However, after further study, the University's administration decided significant savings could be achieved if all phases were combined into one building project."

The proposal to build a new athletic facility coincided with the announcement of the ALLIANCE FOR WASHINGTON UNIVERSITY, a $300 million fund-raising campaign. This major fund drive, one of the largest in any university's history, has helped alleviate the problem of financing the new complex.

"For some time it had been evident that Washington University would have to do a major renovation and expansion of athletic facilities," said Chancellor William H. Danforth. "The cost was high enough that it was necessary to wait until a major fund-raising drive was organized to accumulate resources to do the job well. Accordingly, on recommendation of several groups within the University, the athletic facility im-
Improvement was one of the top priorities in the $300 million Alliance for Washington University.

ATHLETIC PHILOSOPHY

In recent years, it was not policy for Washington University to expand the athletic program. Does the new facility suggest a change?

"Athletics and recreation traditionally have played an important role in student campus life," Schael said. "Hallmarks like antiquated heating, plumbing, and the lack of quality activity space existed in our previous facilities, and we were falling short on meeting the needs and expectations of the students, faculty, and staff.

"The new athletic complex, which is a combination of renovation and new construction, will result in a modern, high quality, first-class complex that will lend itself to creative programming. From the outset, we planned a facility to meet the needs of the students."

In intercollegiate athletics Washington University competes as an independent at the NCAA Division III level. Varsity teams are made up of students who are interested in high-caliber collegiate athletics without the benefit of athletic scholarships.

The University's recruiters continually were finding that student-athletes were choosing educational institutions offering better facilities over Washington University's outstanding academic opportunities and poor, deteriorating athletic facilities. How does the Washington University community now view the new complex?

"The facilities are fantastic," said Deneen Voss, a Washington University senior. "The improvement in athletic facilities over the past three years has been phenomenal. The complex only can help the University with its overall recruiting."

Tom Polacek, a sophomore and a tailback on the football team, said, "When I visited the school last year, I was really impressed with what the University was doing. With its quality athletic facilities and outstanding academic reputation, Washington University is now an ideal school to attend."

"I only have good things to say about the new facility," said Guido Weiss, a University mathematics professor. "I headed a committee in 1972 to discuss the building of such a complex, so I'm very happy to see the finished project, of course. It is a nice addition to Washington University."

Administrators knew, too, that the antiquated facilities were a hindrance to the University's recruiting efforts. "The athletic facilities had detracted from our ability to recruit talented young people who wanted to pursue athletics at both the varsity and recreational levels," Danforth said. "The new facilities should make it possible for us to enroll more such students, as well as provide the space for vigorous athletic programs."
Schael added: “It was a serious problem, not only from the aspect of the varsity athlete, but also the recreational user. The new complex is now a recruiting catalyst for outstanding students and faculty. It demonstrates that the extracurricular programs are important to the University and that the athletic complex is just another one of the excellent facets associated with Washington University.”

Harry Kisker, dean of Student Affairs, said, “The new facilities will enable the University to remain competitive with other major national colleges and universities, who have recently expanded or upgraded their facilities. Brown University, Northwestern, Boston University, Georgetown, Emory, Rochester, and others recognize that today’s best high school students will increasingly make their college choices from among comparable academic institutions, for non-academic reasons. The new facilities already have had a significant impact on admissions recruiting and a positive effect on undergraduate morale.”

“Among the Division III ranks, this building fits within the philosophy where facilities and programs are available to all students on campus,” said Schael. “At many institutions with high-powered programs, athletic departments are autonomous in developing their own facilities through their own fund-raising efforts. Therefore, varsity programs have almost exclusive use of the facilities. At Washington University, we try to balance the use of the facility and encourage participation for all students, faculty, and staff. We do not plan on shifting our priorities.

“The quality of our intercollegiate program should improve with the addition of the athletic complex. I’ve always felt that we’ve had the quality coaching, faculty and administrative support, and the necessary financial resources needed for a successful program. The missing link was a modern facility to carry out our programs. All the ingredients for success are now in place.”

TRANSFORMING THE OLD INTO THE NEW

Access to the four-level complex is through a single main entrance on the east side, facing campus. A north-south concourse in the complex, serving the recreation gymnasium, swimming pool, racquetball and handball courts, is designed to provide future access from the north side of the complex.

The recreation gymnasium is in the northeast corner of the complex. The new swimming pool, racquetball and handball, and squash courts at the northeast corner take advantage of the topography that slopes down to Big Bend Boulevard. Historic Francis Gymnasium remains a prominent focal point.

Several design features are particular highlights. The attachment of Francis Gymnasium to the new complex by skylights is a unique design, as are the many windows that overlook activity centers, creating an open feeling. Graphics, banners, and vibrant colors brighten the interior.

Original University plans did not include development of the existing field house, which is now the central core of the new building. The architectural firm, Pearce Corp. of St. Louis, in association with the New York-based Eggers Group, P.C., proposed a comprehensive solution, going beyond the original University program by resolv...
reconstructed and a new playing floor level was introduced.

The old field house had three levels, but architects decided that only two levels would be needed for the new field house. The former playing floor then became the ideal location for the main recreational locker rooms. Raising the playing floor ten feet effectively reduced the unacceptable steep slope of the upper balcony and improved the sight lines as well. This was both an economical and effective re-use of the former facility.

For sporting events, the new field house seats about 3,800 people. When the playing floor is used for audience seating, the capacity jumps to 4,400.

The new field house has been used for Washington University Bears’ home basketball games, concerts, cheerleading camps, and even a black-tie dinner and dance. It is expected that the new facility will see its first “full house” on November 22, when an old basketball rivalry is renewed between cross-town foes St. Louis University and Washington University.

Circling the field house is the main concourse, a skylit hallway which links the recreational gymnasium, swimming pool, and racquetball and handball courts with a rehabilitated field house and partially restored Francis Gymnasium.

The interiors are a contrast of old and new because of the renovation of the 1902 Francis Gymnasium and the 1928 Field House. The entire north facade of Francis Gymnasium has become an interior element by the adjoining concourse as a skylit atrium, open on four levels.

“There was a natural tie-in with the old building. We thought it would be best to have the total complex integrated as one, the new with the old, to make it more functional and easier for participants to move from one building to another,” said Schael. “We didn’t want to close off the available space we had in Francis Gymnasium. It now houses locker rooms and offices, and we continue to use the gymnasium space.

Another design element present in the new complex is the retention of the basic form of the upper window areas of the field house and their use as open arches between the field house and upper skylit portions of the concourse on the east and south sides.

One important characteristic of the complex is the building’s operation. “It is not complicated for the user once he or she is within the complex,” Schael said. “I believe we have the best combination of function and design that could have been achieved.

“We researched this project very well. We reviewed facilities at Georgetown, Boston University, Northwestern, and other universities. We generated a lot of good ideas to incorporate into our facility. So in essence, we weren’t reinventing the wheel when we planned the new athletic facilities for the Hilltop campus.”

The exterior of the complex was designed to be compatible with the existing 1902 Francis Gymnasium character, but contemporary in form and proportion. The main exterior material on the new structure is an eight-inch brick in brown tones, accented with limestone bands and polished marble.

The care and maintenance involved with keeping the facility in operation is important, added Schael. “The University included an endowment in the total project for building maintenance,” he said. “Everyday care is in the hands of a facilities manager who has primary responsibility and an assistant facilities manager who has secondary responsibility. Their mission is to ensure that the complex is run in a professional manner and that the highest standard of service associated with the complex is maintained.”

Today, Athletic Director Schael looks to a new era of Washington University intercollegiate sports to complement the new facility. The department currently sponsors 16 varsity sports, including basketball, which was reinstated in 1981, and is looking to an athletic future with renewed emphasis. “We are seeking new and attractive opponents; schools with similar academic distinc­tion and athletic direction,” said Schael.

Washington University held its first Lopata Basketball Classic last winter, bringing together teams from Johns Hopkins University, Massachusetts Institute of Technology, Caltech, and Washington University. Visiting teams for this year’s event include Johns Hopkins, Trinity University, and Claremont-Mudd-Scripps.

With some games scheduled through 1989, the football schedule shows “the attractive opponents” that Schael believes will revive interest in the Battling Bears. Under Schael, a former wrestling coach and associate athletic director at the University of Chicago, the number of states and areas where Washington University is recruiting has increased dramatically. The new football and basketball schedules include such prestigious institutions as Trinity, Case Western Reserve, Chicago, MIT, and Rochester.

Schael said: “We didn’t have to create an interest for the facility—the interest was clearly there—what was needed was the space to play. The improved and expanded athletic facilities will strengthen and advance the athletic and recreational programs of Washington University. The complex will provide the students with unparalleled opportunities for participation at all levels of competition in one of the finest facilities in the country. The decision by the chancellor and the Board of Trustees to move forward on the new athletic and recreation facilities has enhanced and will continue to improve the quality of life at Washington University.”
Today's student-athlete at Washington University combines academic talents with rare athletic ability. In this way, they fulfill the Greek ideal of a balance between mind and body. It's interesting to note that the following student representatives all mentioned the University's fine academic reputation. In addition, many of these student-athletes were offered athletic scholarships to Division I, or highly athletically competitive, schools. Even though Washington University provides no athletic scholarships, the varsity athletes still chose to come here because of its academic standards. Below, some of these students, both varsity and intramural representatives, describe what it means to have the right stuff and compete athletically for the University.

DARYL DANIELS, Intramurals
Junior in Arts and Sciences (Biology)
West Newton, Massachusetts

At Washington University we have so many intramural activities, which allow you to participate on an organized scale. I had never wrestled before until I came to school here. Wrestling is so different from anything else I had ever done. Somebody is coming at you and you have to move quickly and think quickly. You would think that wrestling is something that would come naturally, but it's not. You have to know the moves and know how to get out of certain holds. A week before I start, I talk to people about wrestling and ask them what to do. Even though it was something new, I wanted to do my best. And it was a lot of fun. I plan on doing it again—if I gain some weight.

DAVID McHUGH, Diving
Senior in Architecture
Louisville, Kentucky

There's a thrill to diving. Not necessarily scary, but there's a thrill, like parachuting. You're falling a long way. The better you become, the easier it is. The more control you have, the more time it seems you have. For me, perfect dives don't happen all the time, so when they do, it's just the best feeling... it feels so good, and I really can't explain that feeling.
WASHINGTON UNIVERSITY IS SUCH A GOOD ACADEMIC INSTITUTION. ATHLETICS HAVE TAKEN A SECOND SEAT, WHICH THEY SHOULD, TO ACADEMICS, BUT THE ATHLETIC PROGRAM IS JUST REALLY BUILDING UP HERE. I THINK PEOPLE ARE GOING TO FIND THAT EVEN THOUGH WASHINGTON UNIVERSITY IS A DIVISION III SCHOOL, ATHLETICALLY WE'RE VERY COMPETITIVE, BECAUSE SOME OF OUR BEST (SOCCER) GAMES AND VICTORIES CAME AGAINST DIVISION I TEAMS LAST YEAR. I THINK THAT PEOPLE ARE GOING TO FIND THAT WASHINGTON UNIVERSITY REALLY IS A GREAT PLACE TO COME FOR THE ATHLETICS AS WELL AS FOR THE ACADEMICS. BOTH ARE COMPETITIVE.

I HAVE TO MENTALLY PREPARE MYSELF (BEFORE COMPETITION). YOU JUST HAVE TO HYPE YOURSELF UP—GO! GO! GO! JUMP AROUND AND REALLY WORK YOURSELF UP. WITH TRACK, ESPECIALLY WITH THE HURDLES, I HAVE TO SEE MYSELF GOING OVER THE HURDLES OR HIGH JUMP. THERE'S A RHYTHM THAT YOU HAVE TO GET YOURSELF INTO AND ONCE YOU'VE LEARNED THAT RHYTHM, YOU'RE ABLE TO PICK IT UP RIGHT AWAY AND APPLY IT TO ANY SITUATION. YOU JUST HAVE THAT FEELING AND YOU KNOW IT'S RIGHT WHEN YOU DO IT.

I'M DOING PRETTY GOOD AS FAR AS FINDING THE BALANCE BETWEEN SCHOOL AND SPORTS. I THINK THIS IS A SERIOUS CAMPUSS AND PEOPLE DO WHAT'S EXPECTED OF THEM AND MORE SO. BUT I THINK THEY'RE DOING IT FOR THEIR EDUCATION. THE EDUCATION HERE IS VALUABLE, VERY VALUABLE.
TIM SPENGLER, Tennis
Junior, Arts and Sciences
Fairfield County, Connecticut

I get mentally tough and I really push myself before a match. My favorite thing about tennis is winning. I like what comes with winning—you know, the feeling you get when you win a very close match or come back to win. I think it’s great. Yeah, you might say I’m too competitive in some ways. It’s strange, but academically, I don’t compete against others. I compete against myself.

FRED AMOS, Basketball
Fulfilled four-years eligibility last year
All-District, Nominated All-American Senior in Arts and Sciences (Economics)
Chicago, Illinois

I was recruited by Division I schools. And the reason that I didn’t want to go (to one of them) was because I knew that if I went to a Division I school, and I played in their program then I would be a “professional” athlete already. I really wouldn’t be a student. These schools emphasize basketball more than they do your books because you’re on scholarship. I didn’t want to get into that environment. Here, basketball can be compatible with my school life. I was a student first and then an athlete. (The Division I schools) thought I wanted only to play basketball. They didn’t know that I was trying not only to play basketball but to become a better person.
Andy Judson, Intramurals
Senior in Business
Scarsdale, New York

Intramurals are strong at Washington University because of the diversity, not only of the sports, but of the levels. They’re a fun time—that’s the easy way to put it. I think you can compete for fun in the low levels and if you want a more intense activity, you play in the point leagues, which are the better leagues. I use intramurals as an outlet to get away from the pressures of school. I get rid of the aggression that is built up in the classroom. Intramurals is time well spent because you meet people in other areas of the school that you normally don’t see. They (intramurals) bring the campus together.

Edwin Burkett, Football
Senior in Arts and Sciences (Spanish)
Rialto, California

The highlight of this (past) season was homecoming when we beat Rhodes College. That was good for us. It looked like the whole school was (watching us play). You look up in the crowds and you can hear echoes... That added to the electricity of the game. You could feel everyone there. We wanted to win that game so bad. Everyone was out there. We hadn’t beaten this team in 12 years.
Annual Report 1984-1985

WASHINGTON UNIVERSITY
Remarks of the Chairman

We have only to look at the current status of the ALLIANCE FOR WASHINGTON UNIVERSITY to see the progress we have made since the task forces of the Commission on the Future of Washington University made their report in 1981. More than 80 percent of our goal has been raised, a total of over $250 million.

Washington University sets ambitious and important goals for itself, and has a history of moving carefully but expeditiously to achieve them. It is a source of immense satisfaction for me to serve as Chairman of the University's Board of Trustees during a time when a great University is moving toward an even greater future.

This progress did not just happen, it has come as the result of leadership and hard work. My thanks goes to many people, including ALLIANCE General Chairman George H. Capps and his key lieutenants Zane E. Barnes and Richard F. Ford. Their generosity and vision continue to inspire exceptional efforts from thousands of volunteers who have worked in all phases of the campaign.

One of the most visible results of these efforts, has been a series of major construction projects which have altered the appearance of both the Hilltop Campus and the Medical Campus. The School of Medicine's Clinical Sciences Research Building was completed, dedicated and put into service last fall. John E. Simon Hall, the new home of the School of Business, has risen on the site of the former playing fields west of Prince Hall, the School's present home. Workmen are putting the final touches on the University's new athletic facilities complex, after the University successfully met the Kresge Foundation challenge grant in June.

Since the beginning of the campaign, benefactors have created 17 new endowed professorships, six of them in the past academic year. Enormous progress has been made in creating new scholarship, fellowship and loan funds to provide much-needed financial aid for our students. Other gifts to the endowment have funded visiting professorships, lectures, exhibits, and provided new resources for teaching and research. Gifts for annual operations have increased each year during the campaign.

Although we are relatively close to our financial goal, we must intensify our efforts. The last dollars are always the most difficult to secure. But because of the quality of leadership among our volunteers, on the Board, in the University administration, and among our faculty and students, I am certain success is within our grasp.

This has been a year of transition for the University's Board. Beulah S. Stamper, a valued trustee, died June 6, 1985. She had succeeded her husband, the late Howard A. Stamper, on the Board. Four other trustees have completed their terms on the Board. Four new members were elected during the past year. Joining the Board at its 1984 fall meeting were Roma R. Broida and William E. Maritz. Mrs. Broida is a member of the St. Louis and national Boards of Technion-Israel Institute of Technology and received its highest tribute, the Albert Einstein Award in 1984. Maritz is chairman of the board and chief executive officer of Maritz, Inc. Elected at the annual meeting in May were Michael M. McCarthy, chairman and chief executive officer of McCarthy Construction Company, and Kenneth Prewitt, president of the Social Science Research Council. McCarthy, an alumnus of the School of Engineering, was honored by the School last spring for "his dynamic leadership in the national and international construction industry." Prewitt, an alumnus of the Graduate School of Arts and Sciences, will join the Rockefeller Foundation later this year as vice president for programs.

Zane E. Barnes, a trustee since 1972, received distinction for his efforts on behalf of the University at the April dinner meeting of the William Greenleaf Eliot Society. Barnes is chairman and chief executive officer of Southwestern Bell Corporation.

We can be proud of our progress during 1984-85, but our efforts must not lag. In higher education, there is no acceptable alternative to excellence, and no member of the Washington University community, from trustee to youngest freshman, will settle for less than that.
Washington University is a community of learners—faculty learners and student learners. We come from diverse backgrounds. We bring different experiences and perspectives. We often arrive at different conclusions. We are, however, united by our common pursuit of intellectual and personal growth and by our commitment to searching for greater understanding. Those who come to Washington University are stimulating and creative. Youthful hope and idealism, combined with the balance of the more mature, create an environment yeasty with ideas and counter-ideas. The 1984-85 year was no exception. The annual report conveys the facts and statistics that both underlay and evolved from the ferment. The perceptive reader will sense the underlying excitement in the following highlights and in the more comprehensive reports of the deans.

Scientists continue to work better to understand the universe and especially the human condition. One item of particular note occurred on the medical front. The research of Paul E. Lacy, M.D., Ph.D., Robert L. Kroc Professor of Diabetes and Endocrine Diseases, and his collaborator, Dr. David W. Scharp, M.D., associate professor of surgery, resulted in the beginning of a series of operations at the Washington University Medical Center transplanting insulin-producing diabetic cells into insulin-dependent patients. The early results appear promising.

Faculty Distinctions
A number of faculty received recognition for exceptional achievements.
- Peter H. Raven, Engleman professor of Botany and director of the Missouri Botanical Garden, was one of 25 Americans selected by the John D. and Catherine T. MacArthur Foundation of Chicago to receive 1985 MacArthur Fellowships. Raven was cited for his world leadership in conservation efforts in the tropics.
- Two emeriti faculty, Viktor Hamburger and Rita Levi-Montalcini, were named to receive the 1985 Ralph W. Gerard Prize from the Society for Neuroscience. The award recognizes their collaborative work in the 1940s and 1950s, which culminated in the discovery of nerve growth factor and laid the groundwork for broadened understanding of the nervous system.
- Burton E. Sobel, professor of medicine and director of the cardiovascular division of the School of Medicine, received the 1984 Distinguished Achievement Award from the American Heart Association for his research in thrombolytic therapy.
- Virginia V. Weldon, deputy vice chancellor for medical affairs, was elected a fellow of the American Association for the Advancement of Science, the nation's leading general scientific organization. She will also become the first woman to head the Association of American Medical Colleges this fall.
- Linda B. Salamon, dean of the College of Arts and Sciences, was named chair-elect of the Association of American Colleges (AAC); she will chair the AAC beginning in 1986.
- Jack Botwinick, professor of psychology, won the 1984 Brookdale Award for research in gerontology, considered the most prestigious in the field.
- Robert L. Virgil, dean of the School of Business, was elected chairman of the board of directors of the Consortium for Graduate Study in Management, a group of eight major universities which recruit minority students for the MBA degree and careers in business. He succeeds J. George Robinson, professor of marketing, who served as chairman for three years.
- Raymond E. Arvidson, professor of earth and planetary sciences, was named chairman of four national committees which will advise the National Aeronautics and Space Administration (NASA) on the management of data generated by NASA's space science projects.
- Edward S. Macias, chairman of the Department of Chemistry, was named chairman of the Committee on Nuclear and Radiochemistry of the National Academy of Sciences/National Research Council. Michael J. Welch, professor of radiation chemistry in the Department of Radiology, was named a member of the committee.
- Poet Mona Van Duyn, a faculty member of the University's Writers' Program, received a Fellowship for Creative Writers from the National Endowment for the Arts, an award designated for "published writers of exceptional talent."
- Thomas Schiff, associate professor of diagnostic services and head of the division of radiologic services at the School of Dental Medicine, received the 1984 Colgate-Palmolive/American Dental Association Award for outstanding service to the public and the dental profession.
time graduate study. They were among 540 national winners selected from 4,400 applicants. Three Washington University alumni also received NSF fellowships this year, as did two graduates who will do their graduate study here.

A team of students from the School of Law won first place in the regional mock trial competition, out of 16 teams competing.

Junior Joseph V. Meyer won the Mosal Scholar Award of Phi Theta Kappa, national community college honor fraternity, which he will use to attend the University of Zagreb Medical School in Yugoslavia.

Frances S. Kirkpatrick was one of 30 Americans to receive a Marshall Scholarship from the British government for graduate study at the University of Sussex.

The University's chapter of the Society of Physics Students (SPS) was designated an outstanding chapter for the second year in a row by the SPS National Council.

Student Life, the University's 107-year-old student newspaper, received two awards for excellence from the Columbia Scholastic Press Association and the National Scholastic Press Association/Associated Press.

**Visitors and Events**

Dozens, probably hundreds of special visitors, scholars and experts visited Washington University. For example, Alfonso Lopez Michelsen, President of Colombia, from 1970-1974, gave the keynote address at the first major international symposium held in the United States on "Literature and History in 20th Century Colombia."

Speakers from the national media included Richard Reeves, former chief political correspondent for the New York Times; Morton Kondracke, executive editor of The New Republic; and alumnus James Deakin, former White House correspondent for the St. Louis Post-Dispatch.

Noted authors included Natalie Z. Davis, The Return of Martin Guerre; David Shipler, Russia: Broken Idols, Solemn Dreams; William Least Heat Moon, Blue Highways; James Baldwin and poet James Merrill.

Other noted guests included political figures U.S. Senator Bill Bradley, former Secretary of Commerce Juanita Kreps, and presidential candidate Walter Mondale; public figures such as NAACP executive director Benjamin L. Hooks, economist Mancor Olson, scientist and nuclear winter prophet Paul Crutzen, Rabbi Meir Kahane, and alumnus William H. Webster, director of the FBI.

Major conferences included the Olin
Conference on Women, the McDonnell Conference on Higher Brain Function, and the Action for Peace Symposium, which dealt with the topic of violence. Musical events included a recital by pianist Anton Kuerti, a concert of music by Bach, Handel, and Scarlatti, and the Opera Theatre of St. Louis’s production of Gilbert and Sullivan’s “Trial by Jury.” Two major Gallery of Art exhibitions were a retrospective on Jean Dubuffet and a show on architectural ceramics. Student-sponsored activities ranged from a national conference for black students on predominantly white campuses to Thurtene Carnival.

Finally, two events signaled the rebirth of the University’s athletic facilities: Homecoming, with alumnus Harold Ramis (actor-writer-producer of such films as “Animal House” and “Ghostbusters”) as a grand marshal; and the first Lopata Basketball Classic, called the “brain games” by the media because of the high intelligence of players of the competing teams from California Institute of Technology, Johns Hopkins University and Massachusetts Institute of Technology.

**Administrative Changes**

John H. Biggs, who as Vice Chancellor for Administration and Finance played an important role in the growth and financial strength of the University, resigned to become the president and chief executive officer of Centerre Trust Company in St. Louis. He will be succeeded by James R. Buchholz, who has been chief administrative officer of the multicampus University of Missouri system since 1977.

F. Hodge O’Neal retired this spring as dean of the School of Law, capping a distinguished career in legal education. Associate Dean Philip D. Shelton has been appointed acting dean.

I regret the departure of Vice Chancellor for Development Thomas Denny due to illness. He brought fresh insight and dedication to our advancement programs and I am sorry to see him go.

**Links with the Outside**

The university continues its mutually productive relationship with industry. The collaborative efforts between Washington University and Monsanto scientists, previously reported, led quickly to the isolation, purification and characterization of hormones arising from the heart. Further testing and developmental studies are underway. A multi-million dollar agreement has been signed with Digital Equipment Corporation to develop a computing network for both the Hilltop and Medical Campuses and to support advanced picture communications as well as high speed text transmission.

The University remains a place where leaders in business, government and the professions contribute to the learning environment. U.S. Senator Thomas F. Eagleton announced that he will become University Professor of Public Affairs when he retires at the end of his third Senate term in 1986. His experience in law and government, his knowledge of politics and public policy qualify him uniquely in the area of public affairs.

Our University is an active participant in the life of the greater community.

Our new $13 million athletic facilities will be the headquarters for the AAU/USA Junior Olympic Games in 1986, just as our campus was the focus of the first Olympiad held in the Western Hemisphere in 1904.

**ALLIANCE Campaign Progress**

For those of us caught up in the day-to-day operations of this institution, commitment to our mission and our University is not unexpected. But I greet with renewed wonder the enthusiasm and support for Washington University demonstrated by those who choose to become and remain a part of our great University community.

Such overwhelming commitment on the part of alumni, parents, and friends, of business and industry, and of foundations and agencies is clearly the reason for our tremendous progress in the ALLIANCE FOR WASHINGTON UNIVERSITY. At the end of the fiscal year, gifts and pledges to this $300 million campaign exceeded $250 million.

Enough credit cannot be given to those who have provided the impetus for this monumental effort. Our Board of Trustees and their most able chairman, W. L. Hadley Griffin, have been visionary leaders in this campaign, from the convening of the Commission on the Future of Washington University in 1979 through the planning and execution of the fund-raising program. The Alumni Board of Governors, under the leadership of Henrietta W. Friedman and Wilfred R. Konneker, have devoted countless hours to strengthening the ties of alumni to their University.

My thanks to those who have labored so tirelessly and to those who have responded so generously. Every gift, large and small, moves us closer to our goal and enhances a University devoted to excellence.

Our work is not done. A great task remains before us to achieve our goal in this campaign and to continue to embrace the highest ideals in every aspect of University life.

William H. Danforth
Chancellor
Academic excellence and intellectual leadership are the goals toward which Washington University strives. In the Faculty of Arts and Sciences, this translates into education of the highest quality, provided by a faculty consisting of scholars many of whom are recognized leaders within their academic disciplines. This, my first annual report on the Faculty of Arts and Sciences, offers some evidence on how we are doing in pursuing our goals.

Leadership among scholars has to do with the influence of their ideas, both among their professional colleagues and in the larger world. There are cases where an idea's importance is apparent to the naked eye, but these are rare. Generally, we measure the influence of a scholar's ideas by the awards and honors that mark scholarship at the highest levels. The Faculty of Arts and Sciences can boast its rightful share of these. The 1984-85 academic year brought us many more accolades.

**Faculty Distinctions**

Two members of our faculty, Edward S. Macias and Douglass C. North, were selected by the National Academy of Sciences/National Research Council to chair committees that help establish the research agendas for scientists throughout the United States. Macias, newly appointed chairperson of the Department of Chemistry, chairs the Committee on Nuclear and Radiochemistry. North, the Henry R. Luce Professor of Law and Liberty and director of our newly established Center for Political Economy, chairs the Committee on the Emergence of Social and Political Institutions.

Peter H. Raven, the Engelmann Professor of Botany and director of the Missouri Botanical Garden, was awarded a five-year John D. and Catherine T. MacArthur Foundation Fellowship worth in excess of $200,000. Raven is one of 25 individuals to win the award this year.

**Student Achievement**

Not all the honors go to the faculty. In 1985, a team of three Washington University students, William H. Paulson, Richard A. Stong, and Doug A. Walker, tied for first place in the William Lowell Putnam Mathematical Competition. Carl M. Bender, professor of physics, coached the team. In winning, our team placed Washington University ahead of more than 2,000 students representing 350 colleges and universities. We shared first place with the University of California at Davis. Third, fourth, and fifth places went to Harvard, Princeton, and Yale. Since 1976, Washington University teams have finished first four times and second place three times. It is not coincidental that Professor Bender was honored this year with an award for "unusually significant meritorious achievement in teaching" from the Burlington Northern Foundation.

Even deans win honors. Linda B. Salamon, dean of the College of Arts and Sciences since 1979, has been elected to chair the Association of American Colleges in 1986. The AAC is an association of 560 U.S. colleges and universities which promotes liberal learning.

The University recognizes and honors intellectual leadership when it names a professor to an endowed chair. Two Arts and Sciences faculty members were honored in this way in the 1984-85 academic year. Ira J. Hirsh, chairperson of the Department of Psychology, was named Edward Mallinckrodt Distinguished University Professor of Psychology and Audiology. Professor Hirsh is a member of the National Academy of Sciences, the most prestigious scientific body in the United States, and serves as chairperson of the National Research Council's Commission on Behavioral and Social Sciences and Education.

Jane Loevinger, also of the Department of Psychology, was named the William R. Stuckenberg Professor of Human Values and Moral Development in recognition of her pioneering research into the process of character formation. The Stuckenberg chair is the most recent large gift to come to Arts and Sciences as part of the ALLIANCE FOR WASHINGTON UNIVERSITY.

In our search for new faculty, we are guided by our fine academic tradition. Junior faculty are recruited from among the most promising scholars emerging from the strongest Ph.D. programs worldwide. During a seven-year period of non-tenured service to the University, they must demonstrate...
exceptional performance as teachers and as scholars before they are invited to join the tenured faculty. Only about one-third of all candidates for tenure achieve it. Requirements for appointment at the senior level are even more stringent. Randolph D. Pope, our newest professor of Spanish, exemplified this high standard. Not yet 40 years old, Professor Pope is the author of two important books and a score of scholarly papers on Spanish literature. His reputation as a scholar and as a fine and inspired teacher is international. Born in Chile and educated at Columbia University, he comes to us from Vassar where he has served as chairperson of the Department of Hispanic Studies.

These brief sketches illustrate the quality of the Faculty of Arts and Sciences; they are by no means a catalog of all our achievements in 1984-85. Just as important is a heroic effort of working to support our distinguished scholars. The ALLIANCE FOR WASHINGTON UNIVERSITY, since it was launched at 1979, has brought $68 million in gifts and pledges to the Faculty of Arts and Sciences at Washington University, enabling us to continue our pursuit of academic excellence and intellectual leadership. They are gifts inspired by admiration, love and respect, reflecting generosity and vision. Their donors have earned the gratitude of the faculty and of the students they teach.
Renewed interest in the architectural profession by entering college students reflects the improved status of the profession which has accompanied the current upturn in construction nationwide. Only a few years ago enrollment slackened as opportunities for good positions after graduation seemed less promising. I am pleased to report, however, that applications for the Class of 1986 have increased. Graduate student enrollment for the fall semester is much greater than anticipated. And, for most of the spring months we were flooded with requests by alumni/alumnae and colleagues to hire our students and graduates.

In May we conferred 35 Master of Architecture degrees which, together with the 17 Master of Architecture degrees awarded in December, bring the total to 52 for 1984-85. Although most of our students will continue to complete their studies in May, many finish in December reflecting the flexibility of our students' schedules. We also conferred eight Master of Architecture and Urban Design degrees, as well as nine Bachelor of Technology degrees through our evening programs. Bachelor of Arts degrees with a major in Architecture were also conferred on 45 of our undergraduate students by the College of Arts and Sciences.

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New Cooperative 3 + 4 Program
We have developed Cooperative (3 + 4) programs with Grinnell College, Iowa; Knox College, Illinois; Macalester College, Minnesota; The College of Wooster, Ohio; Earlham College, Indiana; and the American College of Greece. These cooperative programs are addressed to students who wish to have an early start on their graduate professional education in architecture. By taking advantage of the program, students can reduce the total time needed for both degrees to seven years. One student from Grinnell has already enrolled, and I am looking forward to a greater presence of such students in the School.

Architects from throughout the United States were prevalent in the 1984-85 visiting faculty program. Robert Mangurian, Thom Mayne and Eric Moss came from Los Angeles, Cynthia and Ben Weese from Chicago, and Alexander Ward from New York. Visitors from abroad included Elisabeth and Jean-Claude Steinegger from Switzerland and Peter Prangnell from Canada. William Curtis from the United Kingdom also spent the latter part of the spring semester with us and we are looking forward to his return.

As the academic year 1984-85 came to an end, we were deeply saddened by the unexpected death of Professor James W. Fitzgibbon. We celebrated his life and his 18 years of service to the University at a memorial gathering in Graham Chapel in April.

Faculty Distinctions
The Earthquake Disc interactive program regarding architectural design and seismic issues is now a reality. Funded by the National Science Foundation and produced by the Urban Research and Design Center of the School under the direction of Dave van Bakergem, affiliate assistant professor, the program has been exhibited at a number of national conferences including the 1985 American Institute of Architects convention in San Francisco.

In March we saw a double exhibit of professor Sheldon Helfman's work celebrating his 25 years of teaching at the School of Architecture, with selected works at the University's Gallery of Art and recent works at Fontbonne College Library Gallery.

Twenty-two high school juniors participated in the Architecture Discovery program this summer, directed by Associate Professor Iain Fraser. The program outlined the opportunities and challenges students could expect from an architectural education and
Eliot Society Membership Doubles

The number of alumni donors who have been recognized through the William Greenleaf Eliot Society has doubled, and special mention goes to the solicitation committee headed by Jerome Sincoff, BArch '56, including Anthony Chivetta, BArch '55, Walter Kromm, BArch '51, Theodore Christner, BArch '57, and Joseph D. Murphy, former dean of the School.

In the Architecture Alumni Annual Fund, chaired by King Graf, BArch '53, alumni participation is up to 25 percent. And, for the first time ever, the average alumnus/alumnae gift exceeded $100!

The 1985 reunions marked the inauguration of a Class Gift. Jamie Cannon, BArch '60, spearheaded the effort to begin a tradition of 25th reunion class gifts. Pat Ackerman, BA '73, MArch '75, GA '75, and Robin Ringwald, BA '75, co-chaired the 10th reunion effort.

Each year we learn of more alumni who have provided for the School in their wills. This is a rewarding demonstration of alumni/alumnae confidence in the School and its future.

In October the School will celebrate the 75th anniversary of its founding as an independent degree-granting unit of Washington University. A joint alumni-faculty committee has been working since spring to plan a weekend celebration. We look forward to seeing many returning alumni-alumnae.

Last year was a good year. And 1985-86 looks to be the best yet.
Major changes began to occur at the business school four years ago when the University accepted the Business Task Force's recommendation to develop the business school into one of the nation's front-ranked business schools, thereby becoming a major asset for the University, for St. Louis, and for American business. As a result, the business school figures prominently in the ALLIANCE campaign, striving toward a minimum goal of $31 million to support distinction in research, teaching, and programs in business. Through the ALLIANCE, we are seeking $13 million to finance construction and to operate, equip, and maintain the new building. The labor and generosity of many persons resulted in gratifying progress toward these goals in 1984-85.

**Opportunity for National Attention**

- John E. Simon Hall, our new building, is a sign of our progress. It gives us an unparalleled opportunity to attract national attention to the School.

Under the direction of Professor Lyn Pankoff, dean of computing, we determined that a system consisting of Digital Equipment's VAX 8600 and VAX 780 computers, at a cost of $750,000, together supporting about 125 personal computers and terminals, will be the best computing configuration to serve our needs. We believe this system, which will integrate our computing needs for research, teaching, and word-processing, will be unmatched by any other business school.

- The Executive M.B.A., which was introduced in 1983, graduated its charter class of 33 students in June. The program, directed by Professor C. William Emory, has been very well received by companies and not-for-profit organizations in St. Louis as an important part of their management development efforts. The third E.M.B.A. class began in September with about 35 new students for a grand total of 70 enrolled in the program.

**Outstanding Faculty Additions**

The business task force focused on the growth and development of the faculty as the greatest challenge facing the School. As a result, this year has been our busiest recruiting year in memory, resulting in six new appointments. Four are new Ph.D.'s coming this fall at the assistant professor level: Thomas Gresik (Northwestern), quantitative analysis; Haim Mano (Chicago), marketing and behavioral science; Prashant Vankudre (Wharton), finance; and Katharine Warne (Yale), finance. Two political scientists from the faculty of the University of Texas-Austin also will join the School as visiting associate professors of political economy: Gary Cox and Mathew McCubbins.

Balancing these new appointments will be absences by some of our faculty. Finance professors Jess Yawitz and William Marshall have each taken a year's leave of absence to become vice presidents, and director and associate director, respectively, of the financial strategies group of Goldman, Sachs and Co. in New York. Kenneth Lehn, assistant professor of business policy, will remain another six months with the SEC in Washington as deputy chief economist and then go from there to a spring visiting appointment at UCLA. Also in 1985-86, Mark Penno, assistant professor of accounting, will visit the University of Chicago, and Laura Starks, who was promoted to associate professor of finance this year, will be on maternity leave. Kofi Nti, assistant professor of quantitative analysis, has accepted a position at Pennsylvania State University.

The School now holds four endowed professorships, two of which remain to be filled: one anonymous, and the other the Philip L. Siteman chair in marketing provided through the generosity of Alvin and Ruth Siteman. These professorships, which we intend to fill during the coming year, permit us to compete for the very best senior faculty, appointments that are crucial to our academic reputation. I hope we might have at least 10 endowed professorships by 1990, building on the success we have had in seeking such funding during the ALLIANCE.

**Faculty Distinctions**

John W. Bowyer, Jr., professor of finance and member of the School's faculty since 1952, received Burlington Northern Foundation's award for outstanding teaching and exemplary contributions to undergraduate education. Powell Niland, professor of management, was honored with the University's distinguished faculty award at Founders Day 1984. Five faculty members were honored as Teacher of...
Admissions at All-Time High

Enrollment in 1984-85 reached an all-time high of 1,100: 456 B.S.B.A.s, 235 full-time and 313 part-time M.B.A.s, 70 E.M.B.A.s, 7 doctoral students, and 25 participants in our Management Study Program. One hundred fifty-one M.B.A.s and 77 B.S.B.A. degrees were conferred at graduation. Of the 98 M.B.A.s and 72 B.S.B.A.s registered with the Business Placement Office, 90 percent of M.B.A.s and 85 percent of B.S.B.A.s were placed or considering offers by midsummer. More than half our placed students chose positions in St. Louis.

Considerable progress was made in admissions, building the applicant pools for our programs so that we can be in a position to select the most highly qualified, motivated students. The most encouraging sign in admissions is in the full-time M.B.A. as applications and acceptances for fall’s entering class were up more than 10 percent. Overall, the quality of admitted M.B.A.s is holding constant. The E.M.B.A. program showed very strong gains. Applications for fall were up 21 percent and our selectivity increased, this year admitting 64 percent of those applying compared to 75 percent a year ago. The quality of our undergraduates is nearly unsurpassed among the nation’s business schools. Average SAT scores for the fall’s enrollees are 1,200, and 80 percent ranked in the top quarter of their high school class. From the pool of candidates for our four-year full-tuition competitive Honorary Fellowship, six of the seven finalists accepted the fellowship. As a group, their quality and academic ability are simply superior.

The growing reputation of our faculty, our strong placement record, the magnificence of Simon Hall, our commitment to teaching, personal attention, and financial assistance have combined to begin to produce the kind of admissions pool we seek. Without the impact of the ALLIANCE campaign, these results could never have been achieved.

ALLIANCE Participation Outstanding

Giving to the School has been tremendous. Our development officers, David Blasingame, M.B.A. ’71, and Kathy Gudermuth, along with John K. Wallace, M.B.A. ’62, president of this year’s Alumni Association Executive Committee, led hundreds of volunteers to accomplish outstanding results. As of June 30, our alumni annual fund total stood at $500,000, up 12 percent from last year and 2.1 times what it was just three years ago. The total annual fund, including unrestricted contributions from all sources stood at $1,127,503, a record-breaking figure for the School. Thirty-three percent of our 7,100 alumni are contributing, giving us one of the top participation rates among business schools nationally. Three hundred twenty of our 1,500 giving club members are in the Eliot Society, and we gained 77 more members at that level thanks to the dynamic leadership of Oliver Goralnik, B.S.B.A. ’30, and his Eliot Society membership committee. One hundred forty individuals are providing named scholarships for our B.S.B.A.s and M.B.A.s through our Scholars in Business Program. Seventeen of these scholarships are endowed, and 14 are funded at the level of $2,500 or more each year.

More than $29 million in gifts and pledges has been received or committed toward the School’s $31 million ALLIANCE goal. Those are remarkable results, but we must not become complacent. If this School is to be the best it can be, our goal for the ALLIANCE must be seen as the minimum. Needs still remain for endowment. Between 1980 and 1984 our endowment grew from $1 million to $7.5 million, but it will have to double or even triple. This year must mark the beginning of $1 million in steady, recurring revenue from our annual fund. The ALLIANCE has sparked new energy in the business school. In its remaining time, we want to be sure that we maintain the momentum.

I am grateful for the commitment of our faculty, staff, students, alumni, friends, and participating companies. Our progress the past year is due to them.

Annual Report • 11
School of Dental Medicine

George D. Selfridge
Dean
School of Dental Medicine

The School of Dental Medicine is moving successfully through a period of financial constraints similar to those now facing most U.S. dental schools, particularly those in the private sector. This situation, caused by conditions beyond our control, does not shake our confidence in the School or our optimism about the future. Dental personnel needs are cyclical and we anticipate an upturn in demand in a few years.

That optimism is best typified by our decision to proceed with a $650,000 facility expansion to be completed near the end of 1985. David A. Bensinger, D.D.S., executive associate dean, is supervising construction which will provide 8,000 square feet on five levels. A Learning Resources Center, the Department of Maxillofacial Prosthetics, faculty offices, students lecture rooms, and biomedical research areas are scheduled for the structure.

Optimistic Future

This year the School of Dental Medicine has officially joined the Washington University Medical Center, as an entity within the University's health care community opening several opportunities for cooperation. The new Pediatric Dental Practice Facility, a joint project with St. Louis Children's Hospital, providing care for both normal and medically-compromised children, is one recent collaboration. An adjoining facility provides necessary oral and maxillofacial surgical care. The departments of diagnostic services and maxillofacial prosthetics are also working to provide dental treatment to patients receiving or anticipating radiation treatment to the head and neck area at the Oncology Dental Support Clinic.

Administrative, Faculty Changes

Richard Brand, D.D.S., has become assistant dean for student affairs, succeeding Charles Waldron, D.D.S., M.S.D., who is concentrating on his role as chairperson of diagnostic services. Four departments—operative dentistry, fixed prosthodontics, removable prosthodontics, and conjoint dental sciences—consolidated into a new Department of Restorative Dentistry, under the leadership of Robert J. McCune, D.D.S. '60, M.S.D. He returns after 13 years as an executive with Johnson & Johnson Dental Products Company.

Rebecca German, Ph.D., teaches anatomy and does related research. Jack Hurov, Ph.D., an anthropologist, joins our Department of Orthodontics to teach and do clinical and basic research in cranio-facial growth and development. Gregory K. Spackman, D.D.S., will supervise the undergraduate teaching program in the Department of Oral and Maxillofacial Surgery. Other full-time teachers are Zavon Kanion, D.D.S., and Terence Leung, D.M.D., Department of Diagnostic Services; Thomas Veraldi, D.M.D., Department of Pedodontics. Peter Takes, Ph.D., a researcher in immunology and bone development, and Koren Ikeda, D.M.D. '85, first recipient of the prosthodontic postdoctoral fellowship, will devote 70 percent of her time to training in the treatment of complex prosthodontic cases.

Student Loans, Gifts

The death last year of Leroy R. Boling, dean emeritus, ended more than 50 years of service to Washington University. Keeping his concern for students in mind, we established a student loan fund in his name. Total funds for student financial aid now exceed $600,000. It is essential, as the federal government withdraws its support, that these funds approach the $1 million level.

Mrs. Edward F. Musgrave contributed an additional $25,000 this year, bringing her total contributions to the Dr. Edward F. Musgrave Memorial Student Loan Fund to $150,000. The Auer Rosenfeld Memorial Student Loan Fund continues to grow, thanks to the consistent support of Arthur I. Auer, M.D. Fred Schudy, D.D.S. '32, has contributed more than $81,000 to establish the James H. and Josephine W. Schudy Student Loan Fund in memory of his parents.

Because of its diligent work, our Office of Admissions received 800 applications for this year's freshman class, enabling us to select 60 well-qualified students. Professors Richard Brand, Zavon Kanion and administrator Marie Liddy visited 23 institutions to encourage applications. Our recruiters also visited several minority colleges and are developing a Health Professions Program for minority students.
Faculty Recognized Nationally
Thomas Schiff, D.M.D., received the Colgate-Palmolive/American Dental Association Award for Outstanding Service to the Public and the Profession. Samir K. El-Mofty, B.D.S., Ph.D., joins Sam V. Holroyd, D.D.S., M.S., who is serving his fourth term on the test construction committee of the National Board of Dental Examiners. El-Mofty will prepare questions in pathology/microbiology, Holroyd's responsibility is in pharmacology. Mohamed A. Marzouk, D.D.S., M.S.D., serves on the test committee in operative dentistry. James McGivney, D.M.D., is the only person in Missouri named a Diplomate of the American Board of Forensic Odontology. Professors Marzouk, Andrew Simonton, D.M.D., and Ronald D. Gross, D.D.S., published Operative Dentistry: Modern Theory and Practice. Research on tea and tooth decay by Memory P. Elvin-Lewis, Ph.D., was featured in a nationally televised science report. And, the Board of Regents of the International College of Dentists designated me as a Master.

My 1980 visit to Indonesia as guest of that government and its navy dental program has led to a close relationship. I shall return to Indonesia with Associate Dean for Educational Development Richard M. Diemer, D.S.D., Ph.D., to consult on administrative and curricular concerns. Later, Richard Smith, D.M.D., Ph.D., Allen Sclaroff, D.D.S., and Professor Holroyd will visit there as consultants in their respective specialties.

Student Achievements
Richard Goldberg, sophomore, will represent our School at the national student table clinic competition at the American Dental Association annual session in San Francisco. Todd Morikawa, a junior, was one of eight nationwide to receive a research award from the International Association for Dental Research.

A computerized clinic information system is three-quarters complete under the supervision of Robert Wilson, administrative officer.

The School's 1983-85 Bulletin received first place for periodical inhouse production by the Health Sciences Communications Association. It has been a very good year and more will follow, in spite of some necessary belt-tightening. The School of Dental Medicine is looking ahead to the best period of its 119-year history.
Student interest in electrical engineering and computer science continues to be extremely high, both nationally and at Washington University. The tremendous attention and importance attached to the new high technology products based on microelectronic and digital technology are causing a high demand for engineers trained in these fields. Both the Department of Electrical Engineering and the Department of Computer Science are operating at or near their capacity for undergraduate instruction. The pressure on enrollment has required the enforcement of relatively stringent controls on the admission of transfer students to both departments. But freshmen and Three-Two students, who will complete a master's degree in five years, are still permitted a free choice of major.

Successful Recruitment
About 200 freshmen will enter the School this fall, along with 55 new students joining the Three-Two program. The merit scholarship competitions have brought Washington University to the attention of large numbers of talented students. The Langsdorf Merit Scholarship competition attracted 392 applicants, of whom 192 became contestants. The abilities of these students were reflected in their college board test scores, which averaged 728 and 645, respectively, on the SAT Math and Verbal College Board Tests. Of these contestants, 92 enrolled in the School of Engineering this fall. The Harold P. Brown Merit Scholarship competition for students in the Three-Two Program has also elevated the number of applicants and insured a pool of top-quality students.

Engineering Technology Division
Arrangements were completed for the transfer of the academic degree programs in Systems and Data Processing from the University College (evening school) Division of Arts and Sciences to the School of Engineering, where the programs are now administered by the Engineering Technology Division. About 800 students in these programs work for baccalaureate degrees and for the Master of Data Processing degree, more than doubling the size of the Engineering Technology Division. This Division provides evening school opportunities to improve professional and technical skills and to acquire new skills in a variety of engineering and computer-related fields for St. Louis-area people.

National Attention
Our computer programming team again performed extremely well in national competition, finishing first in the region, and fifth in the nation. The Mathematical Modelling Competition, inaugurated in 1985, attracted 96 teams from all across the U.S. The Washington University team took first place.

During the 1984-85 academic year, five new faculty appointments were made, and four resignations occurred, bringing the engineering faculty to 72, with 52 being tenured.

Faculty Recruitment
Retention of faculty remains a challenge due to the continuing shortage of Ph.D.-trained engineers. Competition for those few individuals who have the special qualities needed for a successful academic career is fierce. An increasing number of public research universities are receiving substantial financial support from their state governments (for example, in Texas, North Carolina, and California) for research in advanced technologies. Such support is used as an inducement to attract highly qualified engineering faculty and has made the competition for faculty even more difficult for Washington University.

Alumni Gifts
The Class of 1935, celebrating its 50th anniversary reunion, presented the School a gift of $79,075. This record-setting gift was raised by a committee led by Joseph Graves, CE'35, in which 64 percent of the class participated.

The new graduates also set a record with 34 percent of the Class of 1985 participating. Motivated by a $20,000 challenge pledge made by Lester Abbott, AE'29, the gift committee, cochaired...
The School of Engineering is optimistic it will achieve its goal.
The opening of Lewis Center, a classical revival structure on Kingsland Avenue in University City, highlighted a provocative year for the School of Fine Arts. Built in 1909 by University City founder Edward Gardner Lewis to house the Academy of Fine Arts of the American Women's League, the building has been retrofitted to include industrial types of connections. With state-of-the-art equipment, this building allows artists to use technology to work in highly innovative ways. Lewis Center is on its way to becoming a national focal point for art once again, as it was in E.G. Lewis' day.

Classes are divided between two locations: Bixby Hall, the School's headquarters on the University's Hilltop Campus, and Lewis Center. Printmaking, metalsmithing, drawing, painting, fashion design and 2-D core programs are taught in Bixby, while Lewis Center houses sculpture, ceramics, glass, multimedia, graphic communications, and 3-D core programs. This fall the newly renovated photography studios opened at Lewis Center.

Endowments and Scholarships
We have made progress toward securing the School's financial future through the establishment of endowments for scholarships to assist students, and for insuring a stable and outstanding faculty. Trustee Donald N. Brandin, as chairperson, and Mrs. Theodore R. P. Martin, B.F.A. '56, as co-chairperson, launched the School's Capital Resource Committee for the ALLIANCE FOR WASHINGTON UNIVERSITY last November. Sidney S. Cohen has extended a challenge to School of Fine Arts alumni—to increase their gifts to establish an emergency art student loan fund.

The School's new studio apartment at the Cité Internationale in Paris, made possible through the generosity of Mrs. Thomas Pettus and Mr. and Mrs. Wallace H. Smith, promises to provide a unique environment for our students.

Although the freshmen and first-year graduate classes were the smallest experienced in a decade, our student recruitment efforts yielded students of outstanding academic and creative potential. At the same time, the School's served and the range of educational experiences offered are greatly expanded. Our contract printshop with its master printer is attracting leading national artists.

Nash in Forest Park
An example of the type of innovative artist who is coming to campus is David Nash, a sculptor from Great Britain. Two years ago Nash, assisted by students and a chain saw, began to create “Nash in Forest Park,” a large number of works using fallen trees in Forest Park. This year Nash's work was exhibited at Bixby Gallery and he worked with different classes of students. Financial assistance for both came from the St. Louis Arts and Education Council and the St. Louis School Partnership program.

Nash gave a public lecture, participated in individual and group critiques, and produced a series of lithographs in the School's printmaking workshop, collaborating with master printer Howard A. Jones.

High school art classes were brought in city/county pairs to the School of Fine Arts where students saw Nash's works. They also constructed their own wood sculptures from tree limbs and branches provided by the St. Louis Parks Department. These works were photographed and shown to Nash during his spring 1985 residency in St. Louis.

Combining Tradition and Innovation
The traditions of this School and its integrity as an academic unit of Washington University places it uniquely among all other visual arts institutions. The outstanding graduates here are not more outstanding than the best students at other schools, but the top two to five percent elsewhere are equivalent to the top 50 to 60 percent here. Our faculty, perhaps because they realize it is a unique privilege and a challenge to work with these talented students, is equally committed to teaching and to professional artistic pursuits; they take pride in their association with a top quality school.

Small classes providing individualized instruction are the rule rather than
the exception. The School assigns its most expert professors to teach freshmen and sophomores. Graduate teaching assistants apprentice to master teachers.

Change in the School of Fine Arts is not simply a result of growth. The School continues to build upon its rich historical roots—professional artists have been part of this community for more than a century. Yet innovation, essential in the artistic realm, comes naturally from our daily connections with practicing artists. The School’s reputation as a strong painting and drawing place does not preclude the fact that there is very high energy surrounding the photography and glass programs; or that when contacted with a request for the names of recent graduates who could fill a job opportunity, Design Department Chairman Bob Smith’s response was, “All of our good graphic designers have jobs already!”

**Faculty: Committed to Excellence**

Several recent faculty appointments exhibit a dedication to teaching and give special promise. They include Stan Strembicki, associate professor of photography; Dawn Guernsey, assistant professor of drawing; Eric Nordgulen, lecturer in sculpture; Jane Couch and David Lund, visiting professors in painting; and Norman Parker and Tom Seghi, part-time lecturers in photography/design. However, the loss of 11 senior faculty members through retirement by 1986 presents an extraordinary faculty recruitment challenge for the next few years.

A workable relationship between art, science, education, the humanities, and civilization has never been debated more heatedly than now. It is widely acknowledged that works of art are among the highest human achievements. Their importance and power to teach and speak transcend time and place. There is a commitment to a professional educational opportunity at our School, including the opportunity for a strong liberal arts challenge. The faculty is further committed to the notion that the graduates of the School of Fine Arts will become society’s future problem solvers.

Fine Arts students blowing glass in the newly renovated E. G. Lewis Center.
The five years of my deanship have passed with incredible speed, thanks to the cooperation of faculty, staff, and students. Our graduates and friends have been most generous with their financial support, guidance and encouragement. I am grateful for the assistance I have received, and for the kind words so many have extended me on my retirement.

**Acting Dean and Associate Dean Appointments**

Philip D. Shelton has been appointed acting dean of the School, assuming these duties July 1. A graduate of Washington University School of Law, he served as articles editor of the *Law Quarterly* during his senior year. Shortly after graduation, he joined the Chicago firm of Kirkland & Ellis. Later he became law clerk to the Honorable William H. Webster, then Judge of the United States Court of Appeals for the Eighth Circuit. For the last 10 years, he has been associate dean of the School. He has been active in legal education circles, serving from 1976 to 1984 as a member of the Law School Admission Council's Pre-Law Committee, from 1979 to 1984 as editor of the *Pre-Law Handbook*, published by the Association of American Law Schools and the Law School Admission Council, and currently is in his second term on the Council's Board of Trustees. Since 1978 he has been a member of the board of directors of Legal Services of Eastern Missouri.

E. Thomas Sullivan, who joined the faculty in the fall of 1984, has been designated associate dean. Sullivan holds a B.A. degree from Drake University and a J.D. degree from Indiana University, Indianapolis, where he was articles editor of the *Indiana Law Review*. He served as a law clerk to the Honorable Joe Eaton of the United States District Court in Miami, Florida. Sullivan later was a trial attorney in the U.S. Department of Justice, Criminal Division, Fraud Section (Honors Program). He was associated with the New York firm, Donovan, Leisure, Newton & Irvine in the Washington, D.C. office. Before coming to the School, he served five years on the University of Missouri-Columbia School of Law faculty and on two occasions was a visiting professor at Georgetown University Law Center. He authored *AntiTrust Law, Policy & Procedure* among other publications.

**Faculty Distinctions**

During the 1984-85 academic year, the faculty was the largest and probably the strongest in the history of the School. It was composed of 31 full-time members, complemented by a score of highly regarded practicing attorneys. The faculty hold degrees from twenty-one universities. Many faculty are nationally, and some internationally recognized, as distinguished scholars and learned and effective teachers. The faculty has, in the last 10 years, authored 66 books, including 17 law school casebooks and 200 professional and scholarly articles.

Three experienced teachers from state university law schools joined the faculty this term: Gerald P. Johnston, University of Kentucky; Richard B. Kuhns, University of Iowa; E. Thomas Sullivan, University of Missouri-Columbia. St. Louis attorney Kenneth M. Chackes took a leave of absence from his firm during the 1984-85 academic year to teach full time in our lawyering skills program. An honor graduate of St. Louis University School of Law, Chackes has had extensive experience in civil rights litigation in the federal courts in the areas of housing and employment discrimination, education of handicapped children and school desegregation.

**Student Achievements**

The fall 1984 entering class of 197 was chosen from 1,215 applicants. This class came from 106 different colleges and universities in 48 states and the District of Columbia. About three-quarters of the class resides outside Missouri. The median grade point for the 1984 entering class was 3.24; the median LSAT score was 36.

More than 200 undergraduate institutions are now represented in the student body. Forty percent are women; seven percent are minorities.

**Library in Top 25**

The Freund Library has become a valuable resource for practicing lawyers.
The School of Law mock trial team won the regional competition and went on to the nationals in Houston, Texas.

Throughout the St. Louis Metropolitan Area. It is ranked by the American Bar Association as among the top 25 law libraries nationwide. At the end of June, the library contained more than 300,000 volumes, growing at the rate of 10,000 volumes annually. The library has WESTLAW, the computer-based legal research system of West Publishing Company, as well as LEXIS, the other leading computerized legal research system.

Alumni Awards
Our graduates number more than 4,100 and practice in all 50 states. This academic year alumni gatherings were held in Chicago, Los Angeles, Washington, D.C., and Atlanta. In St. Louis, Distinguished Law Alumni Awards were presented to the Honorable Joseph H. Goldenhersh, LW '35, of the Supreme Court of Illinois, and to Norris H. Allen, LW '25, prominent St. Louis attorney. In April the suite of offices housing the Washington University Law Quarterly was designated the Fred Kuhlmann suite, in recognition of his distinguished career. He is a member of the Class of 1938 and a former editor-in-chief of the Law Quarterly.

Alumni contributions have increased every year of my deanship, exceeding the previous year's record-breaking total by 31 percent in 1984-85. W. L. Hadley Griffin, LW '47, chairman of the Washington University Board of Trustees, and Fred L. Kuhlmann, LW '38, both made significant contributions this year. The G. Duncan Bauman Scholarship Fund was also established by his friends. Bauman is the former publisher of the St. Louis Globe Democrat and a member of the Law Class of 1948.

I plan to remain on the faculty, and I am looking forward with pleasure to visiting with graduates at many future meetings.

The School of Law
On December 5, 1984, we celebrated the addition of the two millionth volume to the collection. To commemorate the event, Oscar Handlin, Ph.D., director emeritus of the Harvard University Libraries, gave an inspiring talk on the true meaning of a library, what is involved in the accumulation of two million books, and the central role a library should play in the development of scholarship.

A 400-year old treatise, an important 1610 edition of St. Augustine's *The City of God*, was presented to Chancellor William H. Danforth by Mr. and Mrs. Whitney R. Harris. They donated the book in memory of Mrs. Eugene A. Freund to honor the occasion.

Providing the Best Resources

Professor Handlin made several observations reflecting the Libraries' philosophy. "In order for a library to stand on the leading edge of learning," he said, "it must provide the largest satisfaction in the quest for learning, knowledge, and wisdom." This is the Libraries' central objective: to provide the best collections, resources, and services to support the faculty and students in their quest for knowledge. These two million books were not arbitrarily chosen, nor did they just appear on the shelves. Rather, they symbolize a tremendous, long-term collective effort of work, skill, judgment, and foresight. Assembling the volumes is only the beginning. Each book, periodical, and all the other materials housed in the collection must be properly maintained and preserved, otherwise they will become useless.

Continued growth of the collection creates pressing demands for efficient and proper use of space. We could alleviate this problem by installing compact shelving on Level One of Olin Library. If funded, this could almost triple shelving capacity on Level One, saving millions of dollars in future renovations. The Departmental libraries are also being assessed to determine the most efficient use of space.

Protecting the Collection

Last summer the Libraries installed an electronic book detection system, which has greatly improved service and deterred theft. Although successful, it is but one step which will be taken. The need for a more comprehensive conservation plan is evident and the Libraries are examining the needs and resources required to implement this critical operation.

The Libraries' constant challenge is to make wise choices among competing needs. This takes on new meaning as we incorporate the dramatic technological changes being brought on by the electronic information revolution.

In order to properly serve patrons, the Libraries provide two fundamental sources for information delivery—the traditional printed word, and the newer technological formats. Both are essential and will continue to be the focus of the Libraries' collection development policy, as resources permit.

While the accumulation of two million books is impressive, quantity alone does not make a library great. What gives it importance is quality. The slow process of assimilating the newer forms of information-gathering into the Libraries will require a long-term commitment and create a sustained period of transition. However, we pledge to add technology to our existing collection and resources without suffering any reduction of quality or quantity in the traditional collections and in our service to patrons. This commitment to enriching and enlarging the valuable collections continues to be the Libraries' most important challenge.

Making the Resources Accessible

"Too often," said Handlin, "libraries think of themselves as museums, full of untouchable items for only some eyes. They dig moats to keep the uninitiated away from their treasures." At the Washington University Libraries, our philosophy is exactly the opposite: We believe in building bridges and extending an open door policy to anyone wishing to benefit from our resources. The bridge was officially built last year with the formation and development of the Bookmark Society. This organization serves those who enjoy reading and believe in the importance and preservation of books. Bookmark's success in serving these people is reflected in attendance at the Society's four literary programs and receptions, and the participation of more than 100
members in its book discussion groups. The first program last September drew more than 300 to hear readings by two prominent members of the faculty: William Gass and Stanley Elkin. In November, members heard journalist James Deakin. An informal discussion with Blue Highways author William Least Heat Moon in February and a poetry reading by James Merrill in April concluded the season.

The addition of the two millionth volume, the incorporation of new technological advances, and the creation of the Bookmark Society to support the Libraries' commitment to keeping the Libraries a dynamic force in the advancement of scholarship and wisdom marked 1984-85. As the Libraries look toward the remainder of the 80s and beyond, we are encouraged by our progress and are eager to build upon our two-million volume base.
It is with pride that I provide a sampling of the accolades received by members of the faculty of the School of Medicine. Virginia V. Weldon, M.D., deputy vice chancellor for medical affairs and professor of pediatrics, will soon assume chairmanship of the American Association of Medical Colleges. Saulo Klahr, professor of medicine, will become president of the American Society of Nephrology, and our anesthesiology chief, William D. Owens, will join the Board of Directors of American Board of Anesthesiology. Professors Paul J. De Weer, M.D., Ph.D., and Charles E. Molnar, Sc.D., both received news that they have been awarded research support as Javits Investigators. The McKnight Foundation honored Washington University by appointing Jeff W. Lichtman, M.D., Ph.D., and Mark B. Willard, Ph.D., as McKnight Fellows, and by selecting head of anatomy and neurobiology Gerald D. Fischbach, M.D., as a McKnight Foundation Award recipient. Neither did the Sloan Foundation overlook our School and faculty: Paul R. Taghert, Ph.D., was selected as a Sloan Foundation Fellow. Burton E. Sobel, M.D., chief of cardiology, received the American Heart Association's Distinguished Achievement Award.

Philip D. Stahl, Ph.D., has assumed leadership of the newly formed Department of Cell Biology and Physiology. As department head, Professor Stahl, who has been a member of the faculty for 15 years, will continue his own prolific research on receptor recycling and glycoprotein transport. He will provide support and management for more than 20 faculty members appointed to this new department. The Department of Cell Biology and Physiology was formed through the dissolution of the Department of Physiology and Biophysics.

There were other new appointments to administrative positions as well. Charles B. Anderson, M.D., professor of surgery and head of the renal transplant team at Barnes Hospital, was appointed chief of the Division of General Surgery. Philip E. Cryer, M.D., is the new chief of the Division of Endocrinology and Metabolism, and John A. McDonald, M.D., Ph.D., now heads the Division of Pulmonary Diseases.

**Students**

In 1984-85, the School of Medicine selected a first-year class of 119 students from more than 5,000 applicants. Although we don't believe grade point average is the only reliable predictor of success in medical study, our entering class did have an overall grade-point average of 3.63 in science courses and 3.66 in non-science courses.

The number of students in the M.D./Ph.D. program last year rose to an all-time high of 91. The enrollment in the combined-degree curriculum program has nearly doubled since 1975, when just 47 students entered the Medical Scientist in Training Program. In addition to the 91 students in the M.S.T.P., there were 154 candidates for the Ph.D. in the Division of Biology and Biomedical Sciences—a significant increase beyond the 137 enrolled in 1983-84. There was an increase as well in the number of students enrolled in our eight allied health programs.

**Major Gifts/Financial Support**

The ALLIANCE FOR WASHINGTON UNIVERSITY, our $300 million campaign, is progressing well. I am pleased to say that, at the end of the 1984-85 fiscal year, we had raised $131 million toward our School of Medicine goal: $150 million. I extend my thanks and appreciation to all those who have helped us advance so far so fast. Obviously, proud though we may be of what has been accomplished to date, there is still a great deal of work to be done before the ALLIANCE comes to a close in 1987.

As a result of this support, three new professorships were added, raising to 35 our total number of endowed chairs. The Kroc Foundation of Santa Barbara, California, established a chair to support biomedical research in diabetes and endocrine diseases. Paul E. Lacy, M.D., Ph.D., formerly head of pathology, is the first Robert L. Kroc Professor. Philanthropist Tobias Lewin endowed further heart research at Washington University by establishing the Tobias...
and Hortense Lewin Distinguished Professorship in Cardiovascular Disease. The first Lewin Professor is Burton E. Sobel, M.D. Finally, the continuing support of our alumni has enabled us to announce the second Alumni Endowed Professorship, which will be established in the Department of Pediatrics.

Two new visiting professorships were also added during the year. Due to the generous support of Dr. Richard Sutter and his wife Betty, we have established a visiting professorship in occupational medicine. A visiting professorship in pediatrics was secured by the friends and family of Dr. Donald B. Strominger and dedicated in his name.

The Lucille P. Markey Charitable Trust has helped us to ensure that the School of Medicine can continue to expand its support of young basic science researchers by providing the Division of Biology and Biomedical Science with $360,000 to support research fellows. A five-year gift of nearly $550,000 from the Josiah Macy, Jr. Foundation has also been given in support of young faculty members in the Molecular Basis of Human Disease Program.

The Danforth Foundation, as part of their ALLIANCE campaign commitment, made the largest gift to the School of Medicine during the past year: $3 million for medical research.

We continue to prosper through increases in financial support from the federal government and private corporations. Income from federal sources during 1984-85 exceeded $50 million. The McDonnell Douglas Corporation has increased its support of diabetes-related research at the School. A contract involving the departments of surgery and pathology and the McDonnell Douglas Astronautics Company has provided for the expansion and acceleration of research on isolation, storage, transport and transplantation of insulin-producing cells.

These past 12 months marked the third year of our five-year, $23.5 million contract with Monsanto. As was hoped, the availability of these funds has spurred research in many of the School's 18 departments.

Facilities Update
Last year I was able to announce the completion and dedication of our Clinical Science Research Building. Now, one year later, the new edifice is obviously tightly woven into the fabric of Washington University School of Medicine.

With this year's completion and occupation of the renovated A & P Bakery, now called the East Building, the School of Medicine continues the expansion of its physical plant. The new East Building houses some administrative offices, a new bookstore, and the new magnetic resonance imaging device.

Finally, I am pleased to report the opening and dedication of the new Barnes Hospital Emergency Department. A joint venture of Barnes Hospital and the School of Medicine and built at a cost of nearly $10 million, the 21,000 square-foot department more than triples the size of the old facility. William W. Monafo, M.D., professor of surgery, will serve as director of the new Barnes Hospital Emergency Department.

Philip Stahl, Ph.D., far right, heads the new Department of Cell Biology and Physiology. Clifford Harding, M.D., Ph.D., seated, and Tom Wileman, Ph.D., assist Stahl in his research on the mechanisms of molecule transport within cells.
The celebration marking the 60th anniversary of the founding of social work education at Washington University clearly stood out as the year’s most memorable event for the George Warren Brown School of Social Work. Assistant Dean David L. Cronin led the planning committee which put together the two-day conference on “Excellence and Effectiveness in Social Work Practice,” in May.

**GWB As I Remember It**

The conference comprised four plenary sessions, 26 forums, and a luncheon meeting featuring nationally recognized social work educators and scholars, and leading social welfare administrators and clinical practitioners, all of whom were GWB alumni. They recalled their experiences at Washington University. The program received high marks for the breadth and scope of its coverage, the blend of intellectually stimulating topics, and the social conviviality that made it a unique occasion. More than 400 people attended the conference, coming from 25 states as well as the Bahamas, Italy, and Puerto Rico.

**Curriculum Development**

Following a yearlong evaluation of the MSW program and a review of the changing needs of the field, the faculty approved a new curriculum designed to prepare social workers for advanced practice. This curriculum includes a foundation component on which concentrations in health, mental health, children and youth services, gerontology, and social and economic development will be built. The existing specializations in management and family therapy will remain part of the new curriculum.

**Faculty Research and Recognition**

Professor Martha N. Ozawa, working in conjunction with Consolidated Neighborhood Services, Inc., received a research grant from the Administration on Aging to study elderly volunteers who provide case management services to their peers in downtown St. Louis. Jo Mink, who directs the Child Welfare Training Institute, received funding from the Children’s Bureau of the Department of Health and Human Services for her project, “Continuum of Leadership: Management, Training and Child Welfare.” The National Institute of Mental Health has also funded a training program directed by Larry Davis, associate professor. This three-year program will train minority mental health practitioners to work in the risk areas of teenage pregnancy, drug and alcohol abuse. Assistant Professor Joel Leon heads a program funded by the Administration on Aging to educate geriatric case practitioners, the first of its kind in the nation. The Office of Human Development Services once again funded the Center for Adolescent Mental Health, founded and directed by Ronald Feldman. Professor Feldman continues to head a project studying suicide prevention in runaway youth centers, also funded by H.D.S.

The Bettie Bofinger Brown Chair in Social Policy, established a few years ago, has been filled. Martha Ozawa received this honor in recognition of the caliber and quality of her scholarly work and her contribution to the analysis of income security and social welfare issues in the United States. Bettie Bofinger Brown, wife of George Warren Brown, the School’s namesake, provided the original funding for the establishment of the School.

**Guest Speakers**

Michael Harrington, the celebrated author of *The Other America*, delivered the Benjamin E. Youngdahl lecture on social policy titled, “America: The Next Four Years.” More than 20 lectures were presented as part of the Thursday Lecture Series. Among the speakers were Nancy Amidei, formerly director of the Food Research and Action Center, who spoke on “Hunger in America;” Mark Battle, executive director of the National Association of Social Workers, who discussed the new challenges and priorities confronting NASW; and Thomas Mangogna, M.S.W. ’70, chief of staff, mayor’s office, St. Louis, whose topic was, “Social Work in the Political Arena.”

**New Scholarships**

The George Warren Brown School of Social Work established nine new endowed scholarships as part of a pro-
gram to assume greater responsibility for assisting our students financially. These scholarships were named in honor of Roger Baldwin, Dorothea Lynde Dix, W.E.B. DuBois, Frances Perkins, Eleanor Roosevelt, Albert Schweitzer, Delmar and Helen Templeton, Roy Wilkins, and Eileen L. Younghusband. We have 144 new M.S.W. students enrolled in the program. With many more of our students pursuing at least some portion of the program on a part-time basis, students are taking a longer time to complete their degrees. Thus during the 1984-85 academic year, we awarded 97 Master of Social Work degrees.

Alumni Support
Alumni demonstrate remarkable fealty toward the School. Their gifts have increased substantially over the previous year. The alumni association worked closely with the School, co-sponsoring educational and social programs for alumni and current students. During the 60th anniversary conference, Edward T. Weaver, M.S.W. '61, received the alumni association’s Distinguished Alumni Award. Until recently he served as executive director of the American Public Welfare Association, and, since April, as president of Gulf & Western Foundation in New York.

An enduring challenge before the School is to continue the GWB tradition of excellence in social work education. The content, emphasis, and configuration of that education may vary from decade to decade, and sometimes from year to year, in response to the changing needs of social work clientele, but the focus of that challenge is clear and well-recognized by the faculty who are committed to preserving and enhancing an environment that fosters excellence at GWB.
Financial Condition of the University

The University ended fiscal year 1985 with income in excess of expenditures. However, transfers of $237,000 to student loan funds, $2,742,000 to endowment funds, $7,167,000 to plant funds, and $19,594,000 to other reserves resulted in a decrease of $1,335,000 in general reserves. The income increased 12.1 percent over the preceding year, with the largest percentage increases being from private gifts, current funds investment income, organized patient-care activities, patient and laboratory fees, and other income.

Below is a brief analysis of total income and expenditures, operations of separate fiscal units, and University assets and investments.

**Total Income and Expenditures**

**Income**
The University has four major sources of support for activities represented by its expenditures. These are:

- **Operating Revenue**
  Total operating income, primarily from payments by those who benefited directly from the University's operation, amounted to $226,349,000. Student tuition and fees accounted for $68,097,000. Patient and laboratory fees for medical services provided by faculty and staff amounted to $60,025,000. Income from organized patient-care activities, such as the Edward Mallinckrodt Institute of Radiology, was $44,532,000. The auxiliary enterprises, including residence halls, food service, and bookstores, had income of $17,368,000. Sales and services of educational activities amounted to $16,936,000. Current funds investment income was $8,017,000, while other miscellaneous operating income totaled $11,374,000.

- **Government Grants and Contracts**
  A large portion of the research done by the University is sponsored by grants and contracts from governmental agencies, mostly federal, for specific sponsored projects. Total income from governmental sources expended in fiscal year 1985 was $70,338,000, an increase of $3,514,000 over fiscal year 1984. Scholarships and traineeships accounted for $5,880,000 of the total and $352,000 of the increase. In addition, 90 percent of the total $2,761,000 student loan funds issued under the National Direct and Health Professions Loan Programs was funded by the federal government.

- **Private Gifts, Grants, and Contracts**
  Washington University received a total of $46,207,000 in gifts and grants from private sources for various purposes. Major sources include alumni, individuals, business corporations, and foundations. The graphs below present a breakdown of the total gifts, grants, and bequests received by source and purpose. The total $46,207,000 was divided as follows: $23,720,000 for operating purposes which includes $4,680,000 in unrestricted gifts and $19,040,000 for sponsored research, other sponsored programs, and scholarships; $18,857,000 for endowment; $3,398,000 for plant; and $232,000 for student loans. In the graph, $649,000 in scholarships is combined with $232,000 in loans for total "Student Aid" of $881,000.

  In addition to these private gift sources, the University also receives funds through private contracts for sponsored projects. In fiscal year 1985 these contracts amounted to $10,722,000 which, when added to the $19,040,000...
referred to above, brings the total for sponsored programs to $29,762,000. Of this total, $5,826,000 is being held for future expenses on sponsored programs. The remaining $23,936,000 was expended for current operations in fiscal year 1985 and, combined with the $4,680,000 in unrestricted gifts, brings the total private gift, grant and contract income utilized for operating purposes to $28,616,000. The ten-year chart on the following page reflects large unrestricted grant support from the Danforth Foundation for the years 1976 and 1977 and a large bequest in 1981.

**Endowment**
The investment of endowed funds resulted in $24,654,000 of income used to support operating expenditures.

**Expenditures**
The total operating expenditures of Washington University in fiscal year 1985 amounted to $321,552,000. In 1984 this figure was $282,154,000. Approximately 35 percent of the increased expenditures was attributable to instruction and student aid. Organized patient-care accounted for another 22 percent; 12 percent was in research, primarily supported by outside agencies; and another 12 percent was attributable to operations and maintenance.

Included in operating expenditures is student aid (scholarships, fellowships, and stipends) amounting to $25,578,000 from University income and from governmental and private sources, but excluding College Work Study and the State of Missouri Student Grant Program. The summary on page 29 reflects undergraduate financial aid for the past three years.

Student loans and capital expenditures for buildings are not expended from current funds — their sources are separate fund categories. All student loans issued during fiscal year 1985 totaled $4,262,000, compared with $4,124,000 in the prior year. Net capital expenditures for buildings were $30,658,000. Investments in all physical facilities, including buildings, land, equipment, and library acquisitions, increased $48,063,000.
Summary of Current Funds Revenues, Expenditures, Transfers, and Changes in General Reserves for Separate Fiscal Units of the University for Fiscal Year 1985

Thousands of Dollars

<table>
<thead>
<tr>
<th>Revenues:</th>
<th>Central Fiscal Unit</th>
<th>Faculty of Arts &amp; Sciences</th>
<th>School of Architecture</th>
<th>School of Business</th>
<th>School of Engineering</th>
<th>School of Fine Arts</th>
<th>School of Law</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition and fees</td>
<td>$ 280</td>
<td>$27,746</td>
<td>$2,641</td>
<td>$ 7,378</td>
<td>$10,047</td>
<td>$2,328</td>
<td>$ 5,148</td>
</tr>
<tr>
<td>Government grants and contracts (research, training, financial aid to students, and other purposes)</td>
<td>$ 2,429</td>
<td>10,061</td>
<td>41</td>
<td>41</td>
<td>2,885</td>
<td>30</td>
<td>47</td>
</tr>
<tr>
<td>Private gifts, grants, and contracts</td>
<td>$ 5,471</td>
<td>3,413</td>
<td>111</td>
<td>1,130</td>
<td>2,113</td>
<td>203</td>
<td>222</td>
</tr>
<tr>
<td>Endowment income (a) (b)</td>
<td>$ 2,297</td>
<td>8,394</td>
<td>221</td>
<td>433</td>
<td>1,129</td>
<td>209</td>
<td>503</td>
</tr>
<tr>
<td>Current funds investment income</td>
<td>$ 2,219</td>
<td>750</td>
<td>30</td>
<td>90</td>
<td>232</td>
<td>32</td>
<td>84</td>
</tr>
<tr>
<td>Sales and services - educational activities</td>
<td>$ 1,251</td>
<td>1,649</td>
<td>14</td>
<td>45</td>
<td>1,014</td>
<td>22</td>
<td>18</td>
</tr>
<tr>
<td>Sales and services - auxiliary enterprises</td>
<td>$ 15,233</td>
<td>60,025</td>
<td>28,616</td>
<td>5,471</td>
<td>3,413</td>
<td>111</td>
<td>1,130</td>
</tr>
<tr>
<td>Patient and laboratory fees</td>
<td>$ 44,532</td>
<td>11,374</td>
<td>38,368</td>
<td>15,310</td>
<td>6,017</td>
<td>321,552</td>
<td></td>
</tr>
<tr>
<td>Total revenues</td>
<td>$ 30,600</td>
<td>$52,077</td>
<td>$3,071</td>
<td>$ 9,222</td>
<td>$17,674</td>
<td>$2,830</td>
<td>$ 6,064</td>
</tr>
</tbody>
</table>

| Expenditures and mandatory transfers: | | | | | | | |
| Instruction | $ 1,272 | $20,621 | $1,548 | $ 4,125 | $8,593 | $1,481 | $ 2,070 |
| Research | 60 | 7,639 | 23 | 2,589 | 552 | 2,076 |
| Academic support | 144 | 6,726 | 410 | 1,798 | 1,807 | 141 | 330 |
| Student services | 780 | 2,787 | 111 | 466 | 1,142 | 627 | 367 |
| Institutional support | 1,715 | 2,836 | 133 | 347 | 627 | 135 | 367 |
| Operation and maintenance of physical plant | (661) | 4,726 | 311 | 415 | 1,382 | 435 | 536 |
| Scholarships and fellowships | 1,556 | 9,043 | 669 | 1,540 | 2,362 | 685 | 800 |
| Organized patient-care activities | 38,368 | 13,258 | 10 | 2 |
| Auxiliary enterprises | 6,017 | 2,762 | 154 | 257 | 372 |
| Total expenditures and mandatory transfers | 20,886 | 54,542 | 3,205 | 8,948 | 18,874 | 3,432 | 6,179 |

| Transfers and changes in general reserves: | | | | | | | |
| Transfers to: | | | | | | | |
| Student loan funds | 237 | 11 | 2 | 41 | 1 | 4 |
| Endowment funds | 1,653 | (637) | 7 | (400) |
| Plant funds | 3,000 | 182 | 17 | 232 |
| Other reserves | 5,946 | (1,632) | (158) | 59 | (699) | (116) |
| Changes in general reserves | (885) | (389) | 22 | 150 | (734) | (90) |
| Total transfers and changes in general reserves | 9,714 | (2,465) | (134) | 274 | (1,200) | (602) |
| Total expenditures, transfers, and changes in general reserves | $ 30,600 | $52,077 | $3,071 | $ 9,222 | $17,674 | $2,830 | $ 6,064 |

(a) Endowment at market value with income for:
- Support of current operations | $196,483 | $68,410 | $3,985 | $15,124 | $23,308 | $4,093 | $11,879 |
- Other purposes | 11,055 | 2,407 | 104 | 145 | 2,497 | 477 | 438 |

(b) A portion of the Central Fiscal Unit Endowment Income is distributed to several schools.
Summary of Undergraduate Financial Aid (Excluding Loan Funds)
Thousands of Dollars

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Tuition Remission</th>
<th>Restricted Scholarships</th>
<th>College Work Study</th>
<th>Pell Grants</th>
<th>State of Missouri Grants</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1983</td>
<td>$6,442</td>
<td>$2,212</td>
<td>$1,100</td>
<td>$685</td>
<td>$822</td>
<td>$11,261</td>
</tr>
<tr>
<td>1984</td>
<td>8,760</td>
<td>2,580</td>
<td>1,305</td>
<td>807</td>
<td>890</td>
<td>14,342</td>
</tr>
<tr>
<td>1985</td>
<td>10,181</td>
<td>2,847</td>
<td>1,288</td>
<td>774</td>
<td>920</td>
<td>16,040</td>
</tr>
</tbody>
</table>

Operation of Separate Fiscal Units
The Trustees of the University have adopted a policy requiring each of the schools to operate as an independent fiscal unit. Under the policy, which is called the "reserve school system," each of the independent units is responsible for supporting its operating expenditures with its income, and each maintains its own individual reserves to which are credited any operating surpluses and to which are debited any operating losses.

The Schools of Business, Dental Medicine, Engineering, Law, Medicine, and Social Work have been independent units for a number of years. 1985 was the second year of separate fiscal status for the Schools of Architecture and Fine Arts and the Faculty of Arts and Sciences. General University services and activities such as Olin Library are grouped in one fiscal entity presently referred to as the Central Fiscal Unit. The Central Fiscal Unit is reimbursed for services rendered to the independent units.

The Schools of Business, Medicine, and Social Work, as well as the Central Fiscal Unit, and the Institute of Biomedical Computing, ended the year with income in excess of expenditures. The Schools of Architecture, Business, Medicine and Social Work, as well as the Institute of Biomedical Computing achieved an increase in general reserves in fiscal year 1985. Transfers to plant funds, endowment funds and other reserves resulted in a decrease in general reserves of the Central Fiscal Unit. The Faculty of Arts and Sciences, as well as the Schools of Engineering, Fine Arts, Law, and Dental Medicine ended the year with reductions in their general reserves. As anticipated in the budget plans adopted by the Board of Trustees, the School of Fine Arts and the Faculty of Arts and Sciences utilized portions of quasi-endowment, called the Dean's Endowment, as part of their transition to the reserve school basis. Drawdowns on the Dean's Endowment for the Faculty of Arts and Sciences were $750,000 and for the School of Fine Arts $400,000.


University Assets
Institutions of higher education and other not-for-profit organizations keep their financial resources in the form of funds to comply with the wishes of donors and to account properly for government grants and contracts. A separate fund is established for each project or purpose. The thousands of funds for which Washington University is accountable are handled in four major groupings: current funds, student loan funds, endowment funds, and plant funds. With the exception of income from the investment of endowment funds, the ongoing operating expenditures of current funds may not be offset by resources of the other three fund groupings. The Summary of Assets, Liabilities, and Fund Balances as of June 30, 1985, presents the assets and any claims against them for the four fund groupings.

Current funds must be separated between unrestricted and restricted
Summary of Assets, Liabilities, and Fund Balances as of June 30, 1985
Thousands of Dollars

<table>
<thead>
<tr>
<th>Current Funds</th>
<th>Student Loan Funds</th>
<th>Endowment Funds</th>
<th>Plant Funds</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unrestricted</strong></td>
<td><strong>Restricted</strong></td>
<td><strong>Unrestricted</strong></td>
<td><strong>Restricted</strong></td>
<td><strong>Unrestricted</strong></td>
</tr>
<tr>
<td><strong>Assets:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash and securities maturing within thirty days</td>
<td>$15,773</td>
<td>$6,868</td>
<td>$1,934</td>
<td>$22,140</td>
</tr>
<tr>
<td>Investments at book value</td>
<td>34,969</td>
<td>15,227</td>
<td>2,075</td>
<td>445,858</td>
</tr>
<tr>
<td>Receivables</td>
<td>58,658</td>
<td>6,340</td>
<td>25,082</td>
<td>3,178</td>
</tr>
<tr>
<td>Plant facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>6,629</td>
<td>151</td>
<td>457</td>
<td>13,873</td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td>$116,029</td>
<td>$28,586</td>
<td>$29,548</td>
<td>$485,049</td>
</tr>
</tbody>
</table>

| **Liabilities and fund balances:** | | | | |
| Liabilities | $27,707 | 151 | 253 | 13,873 | $119,854 | 161,838 |
| Deferred undistributed investment income | 37 | 37 |
| Encumbered and committed reserves | 69,398 | 69,398 |
| General reserves | 18,924 | 18,924 |
| Balance of funds | 28,398 | 29,295 | 471,176 | 389,354 | 918,223 |
| **Total liabilities and fund balances** | $116,029 | $28,586 | $29,548 | $485,049 | $509,208 | $1,168,420 |

Funds. The unrestricted current funds consist of revenues from the various income-producing operations of the University, plus unrestricted gifts and unrestricted earnings from endowment. Expenditure of these unrestricted funds is left to the discretion of the University. Other funds available for current operations restrict expenditures to a given department or school, or for special, designated purposes such as research in a specified field or by a specified person. Unrestricted and restricted funds are combined in the overview of current operations of the separate fiscal units presented previously. They are kept distinct in the accompanying Summary of Assets, Liabilities, and Fund Balances.

As of June 30, 1985, the total assets of the current funds were $144,615,000, including restricted current funds of $28,586,000 and unrestricted current funds of $116,029,000. Accounts payable and other such liabilities against unrestricted current funds amounted to $27,707,000. Another $69,398,000 of the unrestricted current fund assets was encumbered or otherwise administratively committed for specific future purposes. The net uncommitted general reserves was $18,924,000.

Student loan funds totaled $29,548,000. The total student loan fund receivables was $25,082,000, of which notes receivable from current and former students amounted to $24,810,000. Outstanding loans to students included $20,288,000 under the National Direct and Health Professions Loan Programs, which were 90 percent funded by the federal government.

The total assets of the endowment fund were $485,049,000, including $467,998,000 in cash and investments. The market value of endowment investments associated with each of the separate fiscal units is presented along with the summary of expenditures and income for each unit.
Plant funds totaled $509,208,000. Of that amount, $446,817,000 was invested in land, buildings, books, and equipment. Total borrowings for physical plant facilities as of June 30, 1985, was $111,673,000, of which $7,832,000 represents Housing and Urban Development bonds for student housing and dining facilities; and $102,655,000 represents bonds issued by the Health and Educational Facilities Authority of the State of Missouri to partially finance the construction and improvement of certain educational facilities.

**Investments**
Income (interest, dividends, rents, etc.) from all investments for the year ended June 30, 1985 totaled $49,564,000 compared to $43,450,000 for last year. Endowment income for the same period was $34,411,000 compared to $30,644,000 for last year.

The market value of all investments (endowment, current, plant, student loans, etc.) including interfund advances (loans) and those securities maturing within 30 days totaled $795,954,000 compared to $602,478,000 for the preceding year.

The market value of endowment funds was $633,478,000 on June 30, 1985 compared to $483,448,000 the preceding year. A comparison of endowment funds over the past ten years is presented in the accompanying chart.

The increase in market value of endowment funds of $150,030,000 is the net result of gifts, grants, and net transfers of $31,160,000, realized market gains of $9,834,000 and unrealized gains on the portfolio as of June 30, 1985, of $109,036,000.

On June 30, 1985 the total investment portfolio was diversified as follows:

- **Cash and short-term**
  - Securities: 17.2%
  - Fixed Income: 28.9%
  - Equities: 52.6%
  - Real Estate and Other: 1.3%

The net income from securities lending was $136,000 compared to last year's $114,000.
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All addresses are St. Louis unless otherwise indicated.

1 Roma Broida Witcoff as of July 25, 1985.
2 Deceased June 6, 1985.
Fighting Heart Attacks

A chemical called t-PA dissolves life-threatening blood clots

By Don Clayton

—I felt like I was being crushed, pinned against a wall.
—After suddenly feeling weak, my heart seemed to blow up to three times its normal size. Then, my arms and neck had a tingly pain shooting through them.
—I felt like I had the worst case of indigestion ever. I started thinking, “What could I have eaten to make me feel this way?” Then my legs buckled and I knew it wasn’t indigestion.
—It was as if I was being squeezed so hard that I couldn’t breathe, couldn’t draw in any air at all.

Four different descriptions of the initial sensations of a heart attack. When carefully considered, the numbers of heart attack victims are nearly as staggering as the symptoms: 1.25 million Americans will have a heart attack this year. More than 500,000 of those people—enough to fill Yankee Stadium 10 times over—will die, 60 percent of them in hospitals, 40 percent before they even reach an emergency room.

In the majority of heart attack victims, the symptoms of the attack are the manifestations of a heart that is suffocating and starving because its blood supply has been cut off by a clot in a coronary artery. The left and right coronary arteries branch out to envelop the entire heart in a net of supply lines. If fat deposits called plaques reduce the supply lines’ diameter, a blood clot can form. When a blood clot closes off a supply line, heart tissue on the downstream side of the blockage suffers devastatingly from lack of oxygen and energy. The speed with which the clot is dissolved marks the difference between death and survival for the heart attack victim. Reasonably then, the speedy dissolution of blood clots has become a primary concern among physicians and medical researchers.

A group of researchers at Washington University helped develop and are now testing a new drug which, within several years of its imminent approval for widespread application, will significantly reduce the number of deaths attributable to heart attacks. Their experimental-work-turned-therapy is a relatively small protein called t-PA, tissue plasminogen activator. T-PA can quickly and safely stop a heart attack midstream by dissolving the life-threatening blood clot blocking a coronary artery.

“We believe this is a genuine advance in therapy,” stated Burton E. Sobel, M.D., professor of medicine and chief of cardiology, when he reported the results of the first pilot study of t-PA’s effectiveness in seven heart attack victims. “In six of the seven patients, t-PA began to dissolve the clot within 20 minutes with no untoward effects. By the time an hour had elapsed, the clot was completely dissolved in the six responding patients,” he added.

The victim’s life—and his quality of life if he survives—depends on how quickly and completely physicians can dissolve the clot and re-establish flow to the blood-starved portion of the heart. How long before the heart is permanently damaged? “Generally, the faster the clot is dissolved, the more heart tissue is preserved,” said cardiology researcher Steven Bergmann, M.D., Ph.D. “T-PA dissolves clots, generally within an hour, even when given intravenously, and thus appears to be the most promising drug in the armamentarium to fight heart attacks.”

It’s not just the speed of t-PA that makes it appealing. Several problems surround the use of other available clot-dissolving (thrombolytic) agents. The two drugs in current general use are streptokinase and—to a lesser extent—urokinase. Over the last five-to-seven years, streptokinase has come to be regarded as the “gold standard” in acute heart attack intervention. In comparison with these two drugs, t-PA has earned its billing as faster, safer, and more effective.

The Advantages

“Streptokinase is a bacterial product, not a physiological substance,” Sobel explains. “Since we all make antibodies against streptokinase, it’s very difficult to define an appropriate dose. Some of the drug will be bound up by antibody and therefore be ineffective.”

By contrast, t-PA is a protein natural to the human body. “When you have a bruise—which is just a blood clot outside a vessel—it doesn’t stay there forever,” says Bergmann. “It dissolves naturally. Current thinking is that t-PA is the physiological agent that promotes the dissolution of clots under normal circumstances.” Because t-PA is a normal human protein, antibody-binding or allergic reactions are unlikely to compromise it.

“The biggest problem with the tradi-
necrotic agents, streptokinase and uro-
kinese," continues Bergmann, "is that they not only dissolve the trouble-
some blood clots in the coronary
arteries, they also cause what's called
a 'systemic lytic state.' They break down
many of the normal coagulation factors
in the blood and really put a person at
risk of systemic bleeding."

The lack of specificity of both uro-
kinese and streptokinase has a direct
effect on the way they are administered.
To get the greatest amount of throm-
bolytic action concentrated at the site
of the clot, the drugs are commonly
injected through a long tube that is
snaked into a major leg artery and
pushed right up to the coronary blood
clot. Putting such a tube in place, called
cardiac catheterization, is a relatively
safe technique, though complications
do not exist in the majority of hospitals
nationwide, and even when available,
valuable time may be lost in preparation
of the treatment room.

Medical director of cardiac catheteri-
zation at Barnes Hospital, Philip A.
Ludbrook, M.D., says "Therein lie
yet another advantage of t-PA. Because
of its superior efficacy, and its specificity
for clots and thus safety, t-PA can be
administered without catheterization."

The Basic Research

As with most new therapies, the
development of t-PA began in the basic
research laboratory.

After learning of the work of Belgian
biochemist Desire Collen, who isolated
and purified the natural clot-dissolving
protein, Sobel immediately realized
that t-PA might be a thrombolytic
agent suitable for use in myocardial
infarction. Subsequent meetings be-
tween Sobel and Collen, of Belgium's
University of Leuven, resulted in col-
laborative, fast-paced, and successful
work. Collen's group had mastered
production and purification of small
amounts of t-PA, while Sobel's group
had extensive experience with other
thrombolytic agents and a very polished
technique for evaluating thrombolysis in
experimental animals.

Early on, Bergmann conducted a key
experiment demonstrating that in
canines, clots would begin to dissolve as
quickly as seven minutes after adminis-
tration of t-PA. "But the most significant
part of that study," Sobel stresses, "was
that we were able to demonstrate that
the experimental animals were not put
at risk of bleeding systemically."

The successful animal study provided
Sobel and Ludbrook with the evidence
they needed to apply to the FDA for an
Investigational New Drug permit. With
FDA approval, they began the seven-
patient pilot study.

On February 21, 1984, Genentech,
Inc., the San Francisco-based genetic
engineering firm, announced that it
would use recombinant DNA technology
to produce sufficient t-PA for trials at
three university hospitals, among them
a Washington University group under
the direction of Alan J. Tiefenbrunn,
M.D. Genentech was encouraged by
animal studies conducted with their
recombinant t-PA, showing that it

Burton E. Sobel, M.D.: "In six of the seven patients, t-PA began to dissolve the clot within 20 minutes with no untoward effects."
works exactly like the t-PA first isolated by Collen.

"Using the recombinant technology," says Sobel, "it’s possible to make large amounts of t-PA in a cost-effective manner."

**In the Trials**

The first clinical assessment of Genentech's t-PA was in a 49-patient trial completed as a cooperative project among Washington University, Massachusetts General Hospital in Boston, and the Johns Hopkins Medical Institutions in Baltimore.

"Intravenously injected t-PA had opened coronary arteries in 39 of the 49 patients who participated in the study," recalls Tiefenbrunn. "Of the 10 patients who didn't respond to t-PA, six subsequently received intra coronary streptokinase, but this was also ineffective in these patients." The effectiveness of t-PA was clearly demonstrated in this trial, and the new drug was thereafter considered such a challenge to streptokinase that a head-to-head assessment seemed the next logical step.

The National Heart, Lung, and Blood Institute had just recently begun the Thrombolysis in Myocardial Infarction Trials. These trials were designed to determine the benefits of dissolving a clot during a heart attack, and to specifically assess the risk/benefit profile of streptokinase thrombolysis. Sobel and Ludbrook, as well as representatives from Genentech and other universities, made a sound case for including t-PA in these trials. At their urging and in consideration of the undeniable strong performance of t-PA to date, the National Heart, Lung, and Blood Institute quickly incorporated t-PA into the protocol for the trials. Twelve clinical centers nationwide took part in the study.

The April 4, 1985, issue of The New England Journal of Medicine published the results of the trial, which had been ended a month ahead of schedule because the findings so lopsidedly favored one drug over the other. "t-PA was more effective by a substantial margin," said Sobel. "Within 90 minutes of intravenous administration, the clot was dissolved in two-thirds of the patients who received t-PA and only one-third of the patients who received streptokinase."

**Good, Better, Best**

T-PA injection through cardiac catheterization is good, but injection intravenously is even better. Both are effective, but I.V. is preferred because it can be initiated more quickly and is safer. Although the risk of cardiac catheterization is minimal, it is still an invasive procedure.

In addition to the time I.V. therapy would save in the hospital, use outside the hospital might save even more time.

"It is entirely reasonable," says Sobel, "to consider that paramedics, often the first healthcare professionals to reach the victim, could administer t-PA intravenously when they establish that the person they are transporting is likely suffering a heart attack."

I.V. injection is less complicated than coronary catheterization by several orders of magnitude. But by far the simplest, and therefore possibly the best, injection method would be the standard I.M., or intramuscular injection. With this approach in mind, Sobel and his colleagues implemented an innovative research program.

"It appeared likely to us," says Washington University researcher Keith A.A. Fox, M.D., Ch.B., "that t-PA would offer the maximal benefit to patients with coronary disease if it could be administered I.M. with automatic injectors. We set out to determine whether blood levels of t-PA sufficient to induce coronary thrombolysis could be attained in experimental animals given the agent by I.M. injection."

The results of this study were published in the June issue of the Proceedings of the National Academy of Science. I.M. doses of t-PA—comparable to the doses given I.V. to patients—induced blood levels of t-PA in the therapeutic range within five-to-15 minutes after administration. This rapid restoration of blood flow to the heart is of great potential benefit.

According to the National Heart, Lung, and Blood Institute, 450,000 of the 1.25 million heart attacks each year in America are secondary; that is, they are not that patient's first heart attack. Three hundred thousand of those 450,000 will die, even though they knew their previous heart attack put them at grave risk of having another. Perhaps someday those 450,000 will carry a t-PA-loaded automatic I.M. injector with them at all times and thus be better able to save their own lives as they feel the symptoms of another heart attack overtaking them.

"Although t-PA has proved to be an effective and safe clot dissolver, it is not a panacea," Sobel warns. "Thrombolysis may buy the patient some time, but it doesn't automatically buy him a cure."

"The coronary arteries where these clots occur are abnormal to start with," continues Sobel. "The clots, as mentioned, generally form where the vessel is narrowed due to plaque build-ups. We're still going to have to deal with the long-term widening or repair of these arteries."

"It's much better to develop a prevention than a treatment," adds Bergmann. Key to the long-term reduction of cardiovascular-caused deaths is research on plaque formation, cholesterol metabolism, and the roles of diet, tobacco, and exercise. Genentech's readily available t-PA also opens the door for extensive laboratory tests that may finally reveal the mechanics of coagulation. Nonetheless, it would be improper to let the immensity of the problem dwarf researchers' recent accomplishments with t-PA.

"The advantages of t-PA are so substantial that it will probably totally replace the agents we have used in the past," summarizes Ludbrook.
I grew up on a farm in a small community called New Berlin, Illinois. Here, my family taught me Christian values, which have followed me all my life. It was also here that I found that I really enjoyed people and wanted to devote my life to helping them. So, I chose social work for my profession.

While at George Warren Brown School of Social Work, I discovered that I wanted to help counsel people. After working in actual social work situations in the school's practicum program, it soon became apparent that poverty wrecks lives and neighborhoods. I also found out that our social welfare system does little but provide a wet Band-Aid for a serious injury.

I'm now working at Consolidated Neighborhood Services, Inc., a team approach agency in inner city St. Louis. Here, I work as a counselor to try to help impoverished people deal with their many problems. I first try to help them get things like food, shelter, and clothing. Then I try to help the individual and the family with any social or psychological problems they might have. Frequently, I feel I'm in the Band-Aid application business myself. You only have to take a walk through the neighborhood where I work to understand what I mean. People live in houses that look as if they are carry-overs from bombed-out World War II Berlin.

The face of poverty is here. One doesn't have to go to a third world country to see it. People trying to find solace in a bottle. Abused children who are afraid to live with and without their parents. Families that are literally tearing apart. People who care more about where their next meal is coming from than they care about which new shopping mall is opening.

I'm needed here. I know this because I have helped some people. I haven't batted a 1.000, but every little victory on
"People live in houses that look as if they are carry-overs from bombed-out World War II Berlin."

Photos by Herb Weitman
"We teach people to help themselves as much as possible."

this battlefield is a big one to me and to the people I try to help.

One day a mother brought her child in for counseling because her little girl had been pulling out large portions of her hair. I asked the child to tell me how she felt about herself. She pictured herself as ugly and fat. I talked to the child about showing kindness to others and helping her mother at home. Once she began helping others, she forgot about her problems and stopped pulling her hair. This sounds like a small problem and a small victory I know. But small problems and victories easily become major ones here.

Something else that is important about my job and where I work. We teach people to help themselves as much as possible. Once we help one neighbor, we get that neighbor to help others in much the same way. Mothers, for example, babysit with each others' children in order to give each other needed relief. I work with these neighbors and together we form a team to fight poverty.

I've been here a year, and I'm still very frustrated. I'm frustrated especially with our current social welfare system. There are often no good alternatives for these people who live in poverty. And frequently they are forced to choose between the best of the worst options available. The current system encourages impoverished people to depend too heavily upon it and to remain in that most vicious of cycles.

My hope and efforts are to work toward positive changes in the present welfare system and to focus on the wealth of resources impoverished people have in their own communities. For example, they could renovate their own buildings and possibly start small businesses such as restaurants if they would only come together. In other words, I want to help them to become independent of outside help.

I've grown a lot in the last year. Many of my friends have chosen different and worthwhile careers. But I've chosen what's right and worthwhile for me.
HALLEY'S COMET

HALLEY'S COMET

REPEAT

ANCE

C

omet Halley, the most notorious
cosmic jaywalker of all time, has
always driven people a little bit
zany. When the great comet last visited
earth in 1910, reactions ranged from
outlandish to tragic.

Quick-witted con artists, for example,
hawked anti-comet pills guaranteed to
protect against deadly comet vapors
that many believed would envelop
civilization as earth passed through the
comet's tail. At $1 per box, a panicky
public gobbled up the nostrums like
hotcakes.

An entrepreneur in San Francisco
peddled comet insurance to superstitious
neighbors at 25 cents per week. The
policies agreed to pay $500 to the wife
or children of any man killed if Halley
collided with earth. A wise addendum
excluded benefits if death were caused
from fright alone.

An Oklahoma group called the Select
Followers made ready to sacrifice a vir­
gin in homage to Halley a t an outdoor
black mass. Happily, the local sheriff
interrupted the ceremony.

A prominent Alabama farmer kissed
his wife and six children a fond good­
bye, then downed a large dose of
strychnine rather than face a world set
afire by the comet.

Chicago housewives barricaded their
homes, stuffing doors and windows with
newspapers to keep out the comet’s
poison gases. Meanwhile, the city’s
Halley Reception Committee ordered
50 cases of champagne delivered on
the night of May 18. After toasts were
made and glasses drained, the bottles
were filled with cometary air and re­
corked in order to hand down a bit of
“Halley’s best” to grandchildren.

As if in some offhand reference to
human lifetimes, Halley sweeps past
earth every 76 years, punctuating the
affairs of humans with its celestial ex­
clamation point and driving people to
distraction. Right on schedule, it is
streaking toward its once-a-lifetime
rendezvous with earth late this year and
early next.

By Robert Brock

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The first “Mr. Comet,” Edmund Halley,
realized that the cosmic jaywalker
visits earth once every 76 years or so.

From our limited vantage point on
earth, Halley’s comet appears to be a
huge, star-like ball of fire. For many
centuries it has gripped our imagination,
a telegram from the gods often carrying
woeful tidings for peasants, kings, and
empires alike.

But according to a theory put forth
in 1950 by “Mr. Comet,” Fred Whipple
of Harvard University, and accepted in
most scientific circles today, comets are
simply dirty snowballs that every now
and again fly past our neck of the heaven­
ly woods.

“The most accurate model for a
comet is a loosely-packed ball of water,
ice, dust, and rocks,” agrees John C.
Brandt, A.B. ’56, chief of the Laboratory
for Astronomy and Solar Physics at
NASA's Goddard Space Flight Center.
Brandt, one of the country’s leading
comet specialists, has written several
books and countless articles about
comets since his graduation from Wash­
ington University (most recently,
The Comet Book, A Guide to the Return of
Halley's Comet). He is actively involved
in two of NASA’s major comet missions
and was a study group chairman for the
International Halley Watch, a world­
wide network of scientists that is
archiving data from this year’s Halley
appearance.

The fun of comet study, Brandt says,
is in figuring out how these insignificant
iceballs create such spectacular fire­
works in the sky.

According to prevailing theory, an
estimated 100 billion comets are con­
tained in a vast cloud of interstellar
material surrounding the solar system
about half the distance to the nearest
star—between five trillion and 15 trillion
miles from the sun. In this twilight of
deep space the sun would appear only
as a bright star. Since comets are too
small and dark to be detected at such
distances, the Oort Cloud (named after
astronomer Jan Oort who proposed the
theory) is more conjecture than fa c t.

But according to a theory put forth
in 1950 by “Mr. Comet,” Fred Whipple
of Harvard University, and accepted in
most scientific circles today, comets are
simply dirty snowballs that every now
and again fly past our neck of the heaven­
ly woods.

Occasionally, says Brandt, the grav­
itational jerk of a passing star will nudge
a comet out of the cloud. The errant
chunk might be launched into deep
outer space, never to return; or it might
be bumped into our neighborhood, falling into a long cigar-shaped orbit around the hub of the solar system. The far end of the orbit is often at the outer reaches of the solar system, billions of miles away.

Itineraries for the 1,000 or so comets for which orbits have been calculated range from 3.3 years and up. Many of them take hundreds, thousands, even millions of years to complete a single trip around the sun. Halley, with a period of 76 years, is an intermediate period comet.

The relentless countdown to the Halley-earth encounter began in 1948 when the comet began its wide arc U-turn 500 million miles outside the orbit of Neptune. It was 3.3 billion miles from the sun and has been gathering momentum during its 38-year journey back. At perihelion—the closest approach to the sun which occurs on February 9, 1986—the comet will be traveling about 122,000 miles per hour.

"When Halley is well away from the sun, it hurtles through space as a solid ball of ice, and nothing much happens to it," says Brandt. But as the comet nears the sun, solar radiation heats the surface. The ices change to gas (without passing a liquid state), releasing the dust they hold in suspended deep-freeze. The gases and dust particles form a roughly spherical cloud, called the coma, around the nucleus. Although a comet nucleus may be only several miles in diameter (Halley's comet is estimated to be about four miles across) the coma routinely measures larger than earth and occasionally expands to Jupiter size. Light reflecting from the coma makes it appear solid, but it is actually cloud-like.

Streaming from the coma, the long filmy tail often extends several tens of millions of miles. The forces of the solar wind and radiation in complex interactions shape the tail. The fact that comet tails always extend away from the sun was well-known as early as the 16th century, yet scientists are still unraveling the secrets of plasma (ionized gas) physics, which control the shape of comet tails.

Because the comet will be far from earth, astronomers predict that the 1985-86 appearance will be the most disappointing in many generations. But poor visibility from earth will not intimidate astronomers determined to make the most of their single shot at the interstellar traveler. As Halley approaches the infield of the solar system, it will become the most scrutinized object in the universe. For the first time, earthlings will dispatch a welcoming party to meet the comet on its own ground: Five spacecraft are now speeding toward the historic encounter.

The Soviet Union launched two probes in December 1984 called Vega I and II. They will meet the comet in March of 1986. Vega I will approach within 6,000 miles, a warm embrace by space standards. Vega II may pass even closer.

The Japanese have also sent two emissaries: Sakigake (Forerunner) and Suisei (Comet). The closest of these will pass through the tail about 120,000 miles from the head, still a pretty friendly handshake, points out Brandt, NASA's representative to the Japanese missions.

The most dramatic encounter will be undertaken by Giotto, a spacecraft launched in July by the European Space Agency (ESA), a consortium of 11 West European nations. The name is taken from the Italian artist who witnessed the 1301 appearance of Halley's comet and several years later substituted its likeness for the Star of Bethlehem in his famous fresco, "The Adoration of the Magi."

Giotto, launched from Devil's Island in French Guiana, is closing on the comet at 151,000 miles per hour. If all goes well it will pass within 300 miles of the nucleus, close enough to identify objects 30 feet in diameter. The spacecraft has a double bumper shield and is jacketed in Kevlar, the material used for bulletproof vests, yet scientists are uncertain how much buffeting it will receive in its close encounter of the

A lithograph showing a sky view of Paris in the 1840s with the giant comet streaking across the sky.
rough-and-tumble kind.

“No one is sure if it will survive the bombardment of particles, many of which may be the size of grains of sand,” Brandt says.

Deprived of their own comet probe by budget slashes five years ago, American astronomers are making the most of alternative plans. U.S. tracking stations will assist all of the foreign missions, and 35 Americans are participating in the Giotto project. In an unprecedented act of cooperation, John Simpson of the University of Chicago was largely responsible for the design and construction of dust sampling devices carried aboard the two Russian ships.

To get more scientific bang for their buck, NASA scientists devised a frugal scheme to send an existing spacecraft on double-duty to a second comet that has come a-visitng this year. Comet Giacobini-Zinner, as it is called, is smaller and less famous than Halley’s comet. It was discovered in 1900 by M. Giacobini at the Nice Observatory and has a period of 6.5 years.

On September 11, a U.S. satellite originally launched in 1978 to study the effects of solar wind on earth’s magnetosphere met this smaller cousin of Halley’s. The craft was renamed International Cometary Explorer (ICE) and “re-launched” from its stationary earth orbit in late 1983. Its maneuvering jets were activated to send it on a close lunar fly-by, which acted as a slingshot, whipping the spacecraft into position for an encounter with the comet Giacobini-Zinner.

Brandt, the comet scientist for the project, notes that “The ICE encounter took place six months before the Halley missions, so it was the first comet in history to be directly explored by spacecraft.” The historic encounter occurred about 6,200 miles from the comet’s nucleus, 44 million miles from earth. Says the scientist: “All the Halley probes pass on the sunward side of the comet while the ICE/Giacobini-Zinner mission looked at a comet from an antisunward side.” Brandt expects valuable results from the study, which will be compared with the Halley missions to form a more complete picture of the nature of comets.

The space shuttle will provide the vehicle for the largest U.S. effort to observe comet Halley. Shuttle flights scheduled for early 1986 will study the comet with ultraviolet telescopes, high-resolution cameras, and other sophisticated equipment. Brandt, for example, proposed an ultra-wide angle camera for the ASTRO-1 mission in March 1986. It will take pictures of the entire comet including the tail. The device will operate for seven days from the shuttle bay with close-up views never before possible unobstructed by earth’s atmosphere.

Although there are bigger, brighter comets, Halley’s comet rates as an all-star for scientific study. The average comet, Brandt explains, is discovered only about two months before it appears. “We’d still be filling out paperwork while the comet was long-gone.” Halley, on the other hand, “does all the things that big comets are supposed to do, but the neat thing is that we know exactly when and where it will appear.”

Thank an Englishman named Edmund Halley (rhymes with valley). The comet bears his name not because he was the first to see it, but because he realized that the comet appearances, which had occurred regularly every 76 years, give or take several months, were actually the same comet.

Halley saw the comet in 1682 at the age of 26. Using this sighting and records of previous visits in 1531 and 1607, he calculated that it would return in 1758. He was only a year off, a miscalculation attributed to minor changes in Halley’s orbit caused by gravitational tugs of the larger planets.

But Halley the scientist never learned that his prediction was accurate. He died 16 years before the comet made him legend.

Historians have traced accounts of this most famous heavenly interloper to 240 BC when Chinese court astrologers made special note of its passage. At every apparition, humans have imparted some special message to the comet’s appearance.

Halley’s comet of 1066, it was said, foretold that Harold, the last Saxon king, would lose his kingdom and his life in the Battle of Hastings only a few months after the comet’s appearance. In 1222, its fiery mane presaged the bloody victory of Genghis Khan and his mongol hordes over the city of Samarkand.

More recently, the 1910 appearance coincided with the deaths of England’s Edward VII and Mark Twain. A year before the fact, Twain told his biographer, Albert Paine: “I came in with Halley’s comet in 1835. It is coming again next year and I expect to go out with it.” His death on April 21, 1910, came one day after Halley’s comet circled the sun.

But the visit of 1985-86 may bring more substantive messages. Scientists are looking to Halley for clues to the
HALLEY'S COMET

innermost secrets of the solar system; to the birth of the planets; even to the origination of life itself.

Comets are believed to be the most primitive objects in the solar system, remnants of its cataclysmic creation some 4.6 billion years ago. According to this theory, comets remain essentially the same as they wander about their orbits in the Oort cloud, leftovers from the solar nebula in perpetual deep-freeze. "If there are traces of molecules that were important in the formation of the solar system," Brandt speculates, "then comets are the logical place to look for them."

Less widely accepted is a theory by British astronomer Sir Fred Hoyle that comets hold living organisms within their icy structures. Comet debris raining down from space, says Hoyle, served as the original seeding mechanism for the ancestors of life on earth.

A swarm of meteors ranging from microscopic dust particles to rocks that are grape-sized or larger accompany many comets, including Halley. These are solid fragments of the comet nucleus, which have been stripped away as the comet passes the sun. They occasionally impact earth's atmosphere, becoming meteor showers.

Meteors almost always burn up in the atmosphere before reaching earth's surface, but they leave a trail of residue that floats to the ground. Hoyle argues that viruses and bacteria raining down from comet-born meteors are the cause of some epidemics even today.

Most scientists are skeptical of Hoyle's theory, yet many agree that comets potentially can have a much more visible—and catastrophic—effect on earth. Some suggest that a comet was responsible for an unusual brightening of the daylight sky and a subsequent explosion in the Tunguska region of Siberia in 1908. A deafening blast flattened every tree within 20 miles of a central point, killed a herd of 1,500 reindeer, and registered as an earthquake at Irkutsk, 550 miles away. Although a meteorite was suspected at first, searches of the area failed to produce a single fragment or a possible impact site. Scientists now suspect a

(Continued on page 34)
IN 1910, the year Halley's comet last swept past earth, space travel was only a flight of the imagination. Yet that didn't stop adventurous scientists from venturing into the heavens to catch a better glimpse of the cosmic traveler. Their voyages in gas balloons often ended up more like wild adventures than scientific research.

Drifting above earth with the infamous harbinger of doom comet Halley nearby was risky business in 1910. News reports of the day warned that "If one of these hot and molten meteorites (from the comet) should strike a balloon, which is filled with hydrogen gas, a huge explosion would occur in which all the party would be destroyed."

Others believed that cyanogen, a deadly gas identified in the comet's tail, might penetrate earth's atmosphere. Most scientists, of course, knew that the concentrations of the gas in the filmy tail posed no health threat on the ground. But what would happen a mile high in the atmosphere?

Among the handful of American and European scientists who defied the comet in the name of science was Professor George Oscar James of Washington University. James joined the University's faculty in 1903 as instructor of mathematics and astronomy, became an assistant professor in 1908, and was named dean of the College of Liberal Arts in 1914. He held that post until his death in 1931. James responded to a city-wide search for a prominent astronomer to make observations in the balloon.

The Aero Club of St Louis and the St. Louis Post-Dispatch jointly sponsored the trip and scheduled it to coincide with the passage of earth through the comet's tail. Aboard the balloon were Professor James, pilot John Berry, and reporter Andrew Drew.

The astronomer intended to determine what effect passage through the tail had upon atmospheric conditions and to observe the meteor showers that many scientists predicted when cometary dust hit earth's atmosphere. For his observations he carried "an aeroscope and aneroid barometer, a sensitive thermometer of the Centigrade scale, a 3-foot telescope, and a pair of field glasses"; the pilot provided the indispensable sandwiches and bubbly.

On the evening of May 18, 1910, the majestic balloon St. Louis III lifted off from the aero grounds at Newstead and Chouteau avenues in St. Louis and took a northeasterly course in a cloudless sky. After seeking the comet in vain at sunset, the adventurers descended near a farmhouse in Carsonville at 7:15. Following a country dinner, the pilot took about 50 children on miniature flights to "see the comet." At 8:45, the scientific voyage resumed.

But Berry failed to notice that the balloon had changed course. The veteran pilot, unable to find his compass, admitted late in the evening that he and the balloon were hopelessly lost. James "came to the rescue with his knowledge of the heavens," reported Drew, and "like a mariner charted our course by the stars."

About 11 o'clock, having seen nothing, James decided to call it a night. As they descended, their ballast gone, the daring aeronauts watched in horror as a Chicago and Alton freight train bore down directly across their descending path. "I'm getting a new thrill every minute!" James exclaimed as they edged a scant 50 feet over the train, narrowly escaping an untimely demise to both the adventure and James' promising career.

Eventually the ship bumped down in a wheat field near Hillview, Illinois, 65 miles from St. Louis. While they maneuvered the grounded balloon over a slippery log spanning a stream, the basket plummeted into the water, drenching the men and their equipment.

At 1 a.m. "after trudging what seemed interminable miles, we arrived at a farm house. We deflated the bag and went to bed."

James' report of the flight, filed the next day in a lead story, ("by phone to the Post-Dispatch"), proved James' early hunch was right on the mark: "I noticed no phenomena which could be attributed to the passing of the comet's tail." James wrote.
HALLEY'S COMET

A small chunk of an asteroid exploded before it reached the ground.

Another theory gaining scientific credibility suggests that comets or meteorites have caused mass extinctions periodically throughout earth's history. A large impact could raise enough dust to change climatic conditions just as wholesale nuclear explosions might result in nuclear winter. According to this theory, a large meteorite may have caused the Great Dying of 65 million years ago when the dinosaurs disappeared. Not to worry, though. Scientists estimate a comet/earth collision happens only once in a million years.

A major hurdle in understanding what role comets have played in life and death on earth is that scientists know little about the actual chemistry of comet nuclei. No one has ever seen a comet's solid core. Existing theories have been deduced from the way comets act and from observations of their gaseous comas. But Washington University researcher and professor of chemistry William Smith hopes that situation will begin to change with Halley's return this year. Smith will take an unusually intimate glimpse at Halley with the aid of a million-dollar instrument that has been ten years in the making called SPIFI (Servo-controlled Polarmetric Fabry-Perot Imaging Interferometer).

The heart of the instrument is a charged couple device (CCD) camera. Designed to photograph extremely low light levels, the instrument comes a hair's breadth from the theoretical limit for visible light detection. It records high-resolution spectral images and is mounted on a device which allows narrow bands of wavelengths to be filtered selectively. This enables Smith's research team to observe the evolution of a specific species of chemical as it progresses from the comet's central core to the tail. At present, no other instruments in the world have SPIFI's particular capabilities, although several other instruments (among them the French and British-owned equipment) are being outfitted to imitate its abilities.

In the past, scientists were able to obtain average chemical composition of comets. But what they saw at the comet exterior was not necessarily what was coming from the nucleus. "Comets exhibit complex chemical reactions very fast," says Smith. "We are trying to determine the chemical constituents of the nucleus. To do that we have to take a look at what happens to chemicals as they are expelled from the comet's nucleus and progress through the coma."

"The timing is perfect for this project," Smith says. "Five years ago CCD technology did not exist at all; it has been available to researchers for only the last two." The observations, which Smith hopes to make from the southern hemisphere for optimum visibility, will be unique. "No one else will obtain precise, simultaneous spatial and spectral data. We feel that it will add an enormous amount of information to our understanding of comets," he adds.

Few expect a major breakthrough in solving the puzzle of the solar system's creation, yet scientists agree that comets are the best place to start searching for clues. Says Brandt: "This year marks the beginning of the golden age of cometary studies, but there will still remain many unanswered questions."

Perhaps the next time Halley sweeps by earth in 2061, we may be able to learn the answers to the origins of the solar system, he adds. "After all, it is not necessary that we know the origin of the universe; it is necessary only that we want to know."
For those excited about their once-in-a-lifetime opportunity to see Halley's comet, astronomers offer some advice: Don't get carried away. This year's celestial show, the experts warn, may be one of the most disappointing in many generations.

The comet is simply not cooperating. In early April 1986, Halley will come within 39 million miles of earth, while 75 years ago the comet brushed by at a distance of 4.7 million miles. This trip its tail may be between 25 and 50 million miles long, as compared to about 75 million miles in 1910. Worst of all, its tail will be longest and brightest when the comet is below the plane of earth's orbit, so viewing will be most impressive from the southern hemisphere between about 20 and 40 degrees south latitude.

Keen-eyed observers in the middle north latitudes, which include much of the U.S., may catch a faint glimpse of the comet in late November and December. It then moves behind the sun in February, and re-emerges as it speeds away into deep space. Although Halley may be visible through much of the United States, it will appear faint and low on the horizon where it will likely be obscured by haze. Peak U.S. Halley-watching is likely to be after dark in late March and early April. The best spots will be as far south as possible: deep in the sunbelt, especially the desert areas of the Southwest and in Hawaii.

But the most important advice is offered by NASA's John C. Brandt: "Find a high hill away from pollution and city lights." The lights, he explains, reflect off the particles in haze and obscure dim objects in the sky. The great comet should appear somewhat dimmer than the North Star, the second brightest member of the Little Dipper; and will be far less bright than the brightest stars such as Sirius and Arcturus. Much of the comet will appear only as a faint, whitish smear traced in the sky. Because the comet will be hard to spot, Brandt advises that amateurs check the exact location of the comet with local astronomers.

Experts suggest that binoculars, not a telescope, will be the best equipment for viewing. For inexperienced sky-watchers, a telescope is too difficult to train on the comet and will not take in its large scope—something like looking at the Mona Lisa through a microscope. According to the consensus of astronomers, a pair of 7x50 binoculars will pick up the stellar sights admirably.

For a more intimate view, a lucky few will peer through heavy lenses at observatories around the country. The Washington University observatory, for example, is expected to do a brisk business during peak comet-periods, say University officials. But they suggest a call to check availability before dropping by for a quick look.

Halley's lack of cooperation has not dampened the entrepreneurial spirit, however. This year, for example, comet enthusiasts will surely get a stellar selection of official Halley's T-shirts.

But the poshest arrangements by far will include a tour or cruise to view the celestial fireworks from the southern hemisphere. A wide selection of tours is available during peak comet-viewing months, from $2,000 to more than $10,000. The best trips will include an astronomer to help point you in the right direction. None other than Carl Sagan, for example, will be aboard the Viking Lines Auckland/Sydney cruise in late March. Guided bus tours through Peru, South Africa, or Australia are also available.

Although the comet may not be at its best, this is definitely the year to don an "official" comet T-shirt, pop a few comet pills, and visit those long-lost relatives down south you haven't seen for a while. Remember, the next performance doesn't begin until 2061.
“Who is the most American of American writers?” An oddly provocative if unanswerable question; but few American or British readers, if pressed, would fail to reply, “Mark Twain.” The answer could have been acceptable beginning soon after 1867 when The Jumping Frog of Calaveras County was published, more certainly after 1869 when The Innocents Abroad appeared. The reply has been made by readers who have liked America and Mark Twain and by those who have considered country and man to be low, coarse, and uncivilized.

The London Chronicle was early and typical in calling Twain “the incarnation of the American spirit.” The English historian James Bryce set down in his influential The American Commonwealth what had been for long a commonplace formulation: “…the West is the most American part of America, that is to say, the part where those features which distinguish America from Europe come out in strongest relief.” More recently, Dixon Wecter, writing the chapter on Twain in the almost official, reverential, three-volume The Literary History of the United States, was only saying what everyone knew when he proclaimed: “In the activities of the external man as well as in character and temperament, Mark Twain was a representative American.”

By such interpretations, Mark Twain, the humorist from the Pacific Slope, is the prototypical American, an improved version of our authentic selves. For us to approve and celebrate Mark Twain, among other things, is an exercise in self-applause. At any rate, in this year of 1985 we are memorializing something having to do with Samuel Langhorne Clemens, just as his admirers did during his lifetime. It is in doubt whether the celebrations, past or present, have been primarily for the writer, the man, the received optimistic image of the man, or for the celebrants. For a bit of each, I should say: whenever we begin to analyze man, writings, or reputation, we find ourselves facing ambiguities.

Narrowly considered, we are at present honoring one major American novel, The Adventures of Huckleberry Finn; yet it is likely—judging from articles, news reports, and invitations to special functions—that the greater emphasis is on the dominant image of the man. Mark Twain loved a party at which he was given an opportunity to speak, to tug at the strings of humor and pathos. In his later years, he spoke often and was honored frequently, perhaps most ostentatiously when given an honorary degree at Oxford and on the occasions of his 67th and 70th birthdays. On those birthdays, George Harvey, the wealthy president of the Harper Company, invited selected admirers to dine with and to honor Clemens. For the 70th birthday party, more than 160 persons dined at Delmonico’s. According to A.B. Paine, Clemens’ official biographer, “the flower of American literature gathered to do honor to its chief,” to applaud “this supreme embodiment of the American spirit.” Each guest was presented with a foot-tall plaster bust of Twain.

Paine reports that the speech that Clemens gave at the second banquet, although “there was always a tenderness under it all,” made his listeners laugh and shout as he humorously sketched his early years; but when he came to his “wonderful close,” the tears were unrestrained—they were let flow without shame. All of this may strike us as smacking of banality and self-congratulation. But Mark Twain’s control over readers and hearers, whether for worthy or unworthy reasons, may not readily be made light of: his image retains its powers; his writings remain what he always passionately wanted them to be, marketable commodities, though whether they are much read may be another matter.

Twain’s status is frequently said to resemble aspects of the fame of Lincoln. As we are perpetually reminded, Howells called him “the Lincoln of our literature.” The reputation he has with the general public resembles in fact something more like that of an amalgam of Babe Ruth, Daniel Boone, Shakespeare, and Will Rogers. Persons who have never read a line of his writings quote or misquote him and express affection for him.

In our unofficial democratic way we have hit on this date of the publication of one of his books as a year to mark.
The first English edition appeared in 1884. And, as I have suggested, whether we wish to memorialize a book or Mark Twain's status as a hero of the culture may be argued. My belief is that the writings do not matter greatly to most Americans. We are for the most part celebrating a persona, the image of a public figure. We celebrate the public man who was our witty spokesman on all occasions. He told us what to think and when to laugh. Even his anti-imperialist, anti-missionary diatribes did not destroy his popularity.

Clemens was a shape-shifter who made himself into "Mark Twain." Clemens turned himself into a myth, wrote stories that are in part fairy tales, and planted doubles everywhere. In The Adventures of Tom Sawyer (1876) and in The Adventures of Huckleberry Finn (1885) protagonists who are for the time children of nature throw off the constraints of an oppressive society. The momentary freedom achieved may appear to be from something as humorously trivial as "other clothes" worn only on Sundays and from Sunday School, "a place that Tom hated with his whole heart." But even in Tom Sawyer the sympathetically circumcised eye perceives that the freedom may also be from the corrupted morals, from the ideologies and mentalités (as we have learned from the French to call those dim levels of consciousness populated by delusions and fantasies) of the "genteel" portion of a hierarchical, slave-holding people.

By extension, the tension exhibited may be seen as existing between the individual and any society, no matter how necessary, culture-giving, and creative of personality that society may be. Hard existential choices exist, or are represented as existing, most particularly in Huckleberry Finn; but Huck rebels against society at key points and makes liberating decisions. Thus, in honoring a book, we celebrate our status as virtuous children of nature, possessors of good hearts and, in consequence, of good morals.

New nations have been insatiable in their need for heroes, and Samuel Clemens was born only 41 years after the signing of the Declaration of Independence. Nations and individuals long to establish their identities. In some instances this has meant projecting the characteristics they admire on public persons who are assumed to be representative of the nation, twins of the admiration citizen: we Twain are one.

Ideas of nationalism, egalitarianism, and a Romantically conceived nature are important themes throughout the nineteenth century: they help to explain our image of the American West, our image of Mark Twain as Adam in a New World garden, and the importance that critics have given to Twain's use of the vernacular. They have to do, too, with America's faith in its millennialist mission, whether thought of as religious or secular. Historians, like the public at large, have been captivated and victimized by these themes.

Scholars and critics are increasingly aware that the characteristics which we have eagerly conceded to Mark Twain may be illusory, belonging less to actuality than to the realm of legend-building, to the mode of dreamed fictions.

A few of the ways in which Mark Twain was not the heroic American that we have liked to think him may be mentioned or briefly sketched. Consider the matters of art, money, and self-reliance. Twain enjoyed writing and wrote an almost unbelievable number of pieces, finished and unfinished, published and unpublished; but on the whole he took a keener interest in making money than in creating a work of art. Technological inventions fascinated him, especially when he thought they might be turned into money-machines. He tended to be the companion of robber barons, not of yeomen. He speculated compulsively, incurring losses that led the publishing house he founded and owned to declare itself bankrupt in 1894.

Although Clemens protested that neither he nor Olivia Langdon, his fiancée, was interested in money and that he intended to paddle his own canoe, he gleefully accepted a handsome house as a wedding present...
to organize a subscription fund and cajole the public into rescuing him from his financial difficulties.

Like any other author, Clemens preferred to write well rather than badly, but he disliked revising, proofreading, and devising satisfactory structures. He answered charges of ignorance and vulgarity by protesting that he wrote for the many, not for the few; yet he relentlessly sought the praise of the few. He customarily thought of his books as objects for sale and was tireless in promoting them.

Clemens' elitism revealed itself in various ways—in his marriage, his friends, his politics, his craving for power, his admiration in life and fiction of empowered individuals, and perhaps most obviously in his attitudes toward "inferior" races. During this year of celebration and at other times he has been sharply attacked as racist and hotly defended as a friend and benefactor of blacks. Demands— to my mind absurd—have been made that Huckleberry Finn be removed from the libraries of public schools because of its racist coloration, and it has in fact been removed from some libraries. As I read the book, there are racist passages in it, though "Nigger" Jim, as every reader recognizes, towers for a time to moving and mythic proportions.

Was Clemens racist? Much depends on one's definition of "racist." There is the question of the allowances one is willing to make for a person of Clemens' period and background. By current standards, I judge that he was without question racist. He gave money to blacks; but he patronized them, sentimentalized them, and made them into vaudevillian figures of fun. And if his attitudes toward blacks were to our present mind racist, his views on American Indians, until he somewhat modified them late in his career, were immeasurably less defensible.

Mark Twain's qualities and beliefs were inconstant, and evidence, thin or substantial, may be assembled to support nearly any opinion about him. I set down here, nevertheless, notes to indicate that he was not suited to be the exemplar of Americanism. This archetypal Westerner lived his life after 1877 in the East or (for many years) in Europe. He felt alienation, considered suicide, and arrived at a radical distrust of life. He came to despise "the damned human race." From his early years he longed to escape from normal duties and obligations. He thought himself most happy when he could isolate himself atop a mass of luggage in a jouncing stage coach or sit quietly at ease on a

**He**

answered charges of ignorance and vulgarity by protesting that he wrote for the many, not for the few; yet he relentlessly sought the praise of the few.

ship or recline afloat in a small boat on then beautiful Lake Tahoe, slipping into a union with nature.

He suffered from deep-seated feelings of euphoria and guilt that were matched by periods of megalomania. He was given to irrational fits of rage. His family life was not the idyll that biographers have painted. He expressed self-pity for monetary losses and family deaths, sometimes in maudlin greeting-card verses.

He was confusedly determinist, following popular "scientific" treatises, but he also assumed the existence of a God whom he portrayed toward the end as malignantly intent on the destruction of Samuel Clemens, a good and deserving man.

Neither Twain's views on sex nor his own sexuality were what one expects of the virile hero of a liberated people. Although he collected in his notebooks tag lines for an astonishing number of dirty jokes, he made a fetish of chastity in women and tended in an antique, common way to see women as saints or whores. In conformity with his demand for purity, he went to absurd lengths to keep his daughters separated from men and wrote that there should be no "age of consent"—the man is always the seducer and should be punished as such. His sex drive was powerful, yet he feared mature sexuality. Judging from his mourning complaints on the subject, he became impotent at 50. During his later years, to the protective distress of his daughter Clara, his biographer, Paine, and his editor at Harper's, Frederick Duneka, he chased incessantly after prepubescent girls and made companions of them, although his pedophilia almost surely remained unconsummated.

The image of Mark Twain as an exemplary American has already displayed astonishing resilience and staying power; self-admiration is a hardy perennial. The image should change rapidly to conform to what may now be discerned as reality, but will it? In Mark Twain's life, in his writings, and in the scholarship, almost nothing is simple or single: doubles, maskings, traps, and uncertainties lie in wait everywhere, like anarchically staring lions in a painted jungle by Rousseau, "Le Douanier." Logic fails, evidence evaporates; the world of solid expectations turns to water.

When not painting his barn or otherwise keeping his 19th century Walpole, New Hampshire, farmhouse pristine. Guy Cardwell, professor emeritus of English at Washington University and editor of the Library of America volumes on Mark Twain, is an active editor and literary critic.
Six Steps for Puncturing a Ballooning Deficit

The annual budget debate has become a sad spectacle. We all know what has to be done—and neither the Congress nor the White House is doing it. It is not a question of bringing an outlandish $200 billion deficit down to merely an outrageous $180 billion or a bloated $150 billion annual level. It is a matter of restoring our country’s finances to some semblance of order.

To be sure, recent experience has shown us that $200 billion deficits do not spell the collapse of the American economy. Yet I am not of the school of thought that claims the effects, albeit severe, will only occur in the distant future. To be convinced that deficits do matter, we need only to get out of our offices and look around. We know which sectors have been hardest hit by the resultant high interest rates and strong dollar: (1) agriculture, the most capital-intensive part of the economy, and (2) traditional durable goods industries, which find it difficult to compete with foreign firms that benefit from the low exchange rate of their local currencies.

I concede that you can fuel lots of fascinating academic disputes by trying to measure precisely how much of our economic problem is due to those budget deficits. The key fact remains, however, that curtailing the deficit is the basic responsibility of the federal government. It is the key economic lever that our legislators control directly.

Most of the attention is being given to the proposed reductions from the fiscal 1985 levels of spending. That ignores the spending growth that has taken place since 1980. Many program areas have grown much faster than the 30 percent rise in the rate of inflation during this period. In these five years, national defense outlays are up 89 percent, foreign aid and other international programs are up 60 percent, Social Security and Medicare are up 71 percent, and farm programs (mainly subsidies) are up 291 percent.

The key to dealing with the deficit problem is not to emphasize the hole in the doughnut—the painful cuts that are being proposed. Rather, policymakers need to carefully examine the doughnut itself—the many doubtful items of federal expenditure that remain in the budget. For every sacred cow that is now being offered for slaughter, another remains shielded from the federal budget knife. The best way to reduce the deficit—and to lay the foundation for responsible tax reform in the years ahead—is to carry through that necessary pruning of federal spending programs.

In expanding the current focus of budget cutting, the Congress should consider the unevenness of budget restraint to date. The proposed reductions or eliminations in the Small Business Administration, Export-Import Bank, etc., are severe—although, in my view, desirable. But if these special-interest programs are to be curtailed, what about the many other special-interest activities that have survived budget review?

For example, in some federal lending programs the interest rate is so low that it is equivalent to forgiving half or more of the loan—66 percent in the case of Bureau of Reclamation credit. If the budget cuts are considered unfair, it is not because they cover too many programs, but too few.

If it is desirable to reduce farm subsidies—and I believe it is—why is the Federal Government continuing to authorize new Corps of Engineers projects which will increase the amount of land on which surplus crops will be raised? Why phase out general revenue sharing—which comes with few strings attached—but only make modest reductions in categorical grants to states and localities? Can it be that the federal agencies, when we get down to the wire, are more concerned with keeping control over state and local governments than with reducing the deficit?

A Specific Plan for Budget Cutting

Here are six specific proposals to achieve comprehensive budget cuts.

1. Slow down the rapid pace of defense spending. The target for defense spending announced in the 1980 campaign—5 percent a year increase plus allowance for proposed inflation—has been overshot substantially. Surely our defense posture has not deteriorated since 1980. Large reductions in new appropriations are needed to return the Pentagon’s spending level to the original trendline—5 percent real annual growth from 1980. Rather than the $278 billion of outlays projected for fiscal 1986, this would infer holding to $235 billion, a reduction of $43 billion.

The most harmful effect of the runaway military budget is not the adverse economic and financial results, such as higher interest rates. Instead, it is the erosion of public support for the defense establishment. In the dangerous world in which we live, it troubles me to see the sharp shift in sentiment on this matter over the last four years.

Secretary of Defense Caspar Weinberger loves to remind us that we cannot balance the federal budget simply by reducing military outlays. He is right, but substantial defense cuts are an essential ingredient of any successful effort to reduce overall federal spending. Otherwise, supporters of civilian programs that are being cut can properly raise the “fairness” issue.

2. Eliminate the COLAs in entitlements. It is time to acknowledge that the public has an erroneous concept of “social insurance” programs. Social Security recipients believe they are “entitled” to their monthly checks because they paid for them during their working years. The truth of the matter is that most of the people on the Social Security rolls have long since gotten back all they paid in—plus employer contributions and interest. The difference is made up by the generation now working. Is that the economic equivalent of welfare? Yes, it is.
Retroactive benefit increases for cost-of-living allowances (COLAs) are not part of most private insurance systems. The beneficiaries did not pay for them. Thus nobody is “entitled” to them. The Congress should begin to reduce and then to phase out automatic annual cost-of-living benefit increases in these government programs.

3. Apply some insurance principles to Medicare. Every automobile insurance policy has a deductible in it to avoid overwhelming the system with minor claims. The same approach should be used in health insurance, notably Medicare. A greater use of cost-sharing would force hospitals and physicians to think of the individual patient and not big government in incurring costs and making charges.

4. Eliminate the “double whammy” in federal lending programs. The demand for federal credit continues to grow rapidly. These financing activities have been typically set up because some people are not deemed credit worthy by private financial institutions. To grant that type of aid is a political judgment properly made by Congress. The catch is that these credit programs almost always loan out the government’s money at interest rates much lower than private lenders charge—lower even than the Treasury pays for the money in the first place.

These interest rate subsidies encourage people to get government loans, rather than to look to private credit markets or to their own resources. As a minimum, federal credit programs should charge the same interest rates as the Treasury pays.

5. Phase out subsidies to businesses and farmers. The average taxpayer has a lower income than the beneficiaries of most federal programs aiding agriculture and industry. The small family farmer does not receive much of these large subsidies. Similarly, most businesses do not benefit from the government’s assistance to a lucky few firms. Getting interest rates down via budget cuts would do the most good for farmers and business firms alike.

6. Do not ignore the many other areas where spending continues to grow rapidly. Where should the Congress stop in making budget cuts? An adequate and comprehensive budget restraint effort should be based on the old maxim, “Good budgeting is the uniform distribution of dissatisfaction.” Not enough of the spending agencies and their supporters are dissatisfied.

I know that I am urging the President and the Congress to make many tough and even initially unpopular decisions. But the meter is running. Interest payments are mounting steadily. Delay means choosing in the future between even larger and tougher spending cuts and substantial and more unpopular tax increases. Every examination of the soft spots in the budget shows that they do not deserve being funded by increasing the tax burden on the American public. The only satisfactory answer to a budget that is fundamentally out of control is to control it now!

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"Viewpoint" was created to air faculty, student, and alumni opinions on current topics and University research subjects and represents only the views of the author and not necessarily those of the magazine staff or the University.
The racquetball and squash courts are just part of the attraction to the new $13-million athletic complex. (See story page 6)