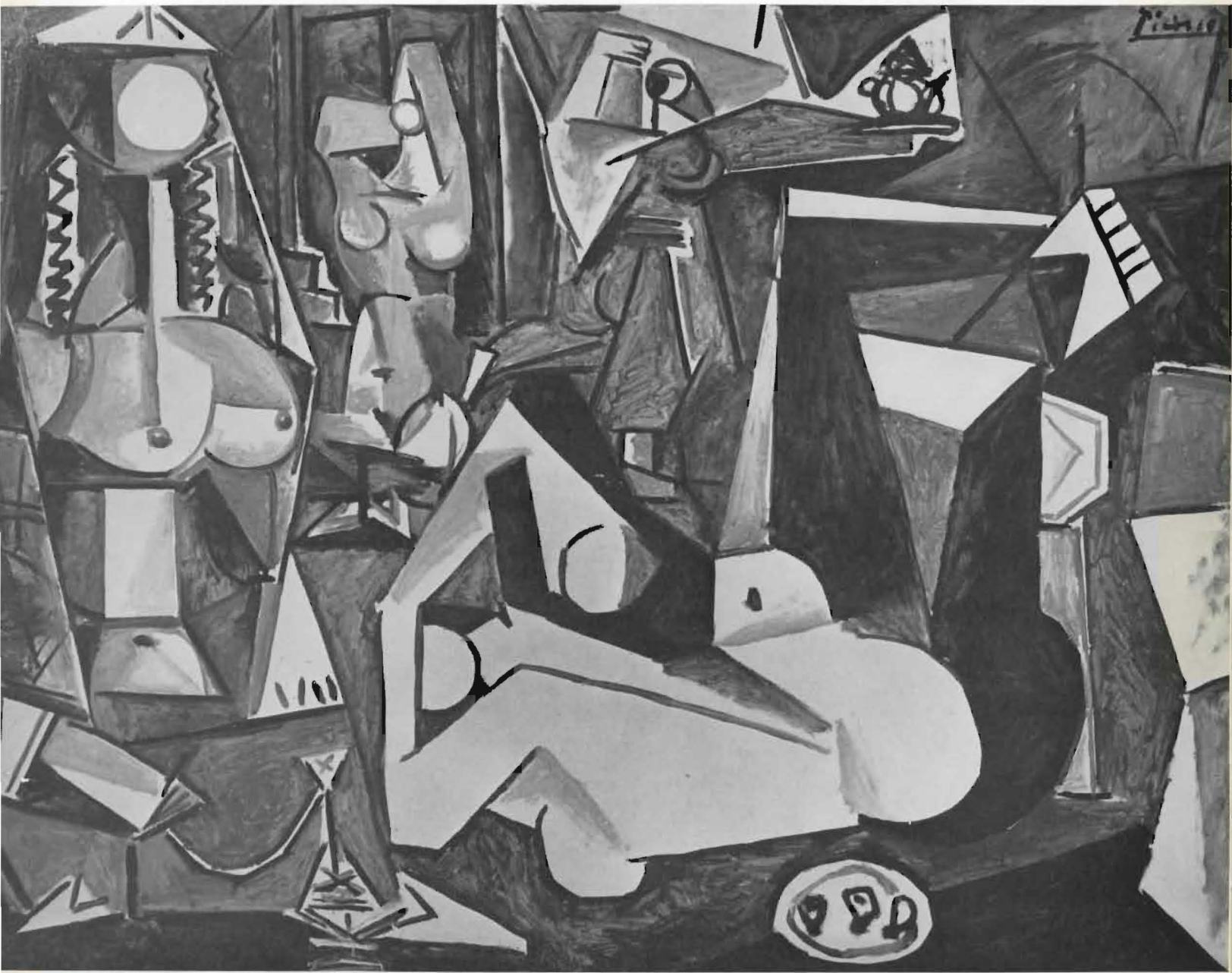


WINTER 1975

# Washington University Magazine

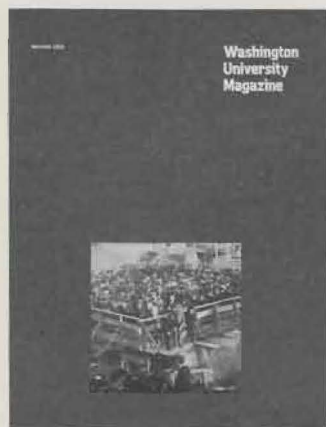


"Les Femmes d'Alger" by Pablo Picasso was a recent gift to the University of the late Mrs. Mark C. Steinberg. The oil is fourteenth in a series of fifteen paintings Picasso did in late 1954 and early 1955 based upon a work by Delacroix. It is part of a current exhibit at Steinberg Gallery entitled "Gifts, '74," featured on pages 38, 39.



# Washington University Magazine

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COVER: On October 20, 1900, cornerstone ceremonies are held on the site of Busch Hall, first building construction on the University's Hilltop campus. On back cover, work progresses on the latest campus structure, the life sciences building. See "The Hilltop Campus," beginning on page 2.

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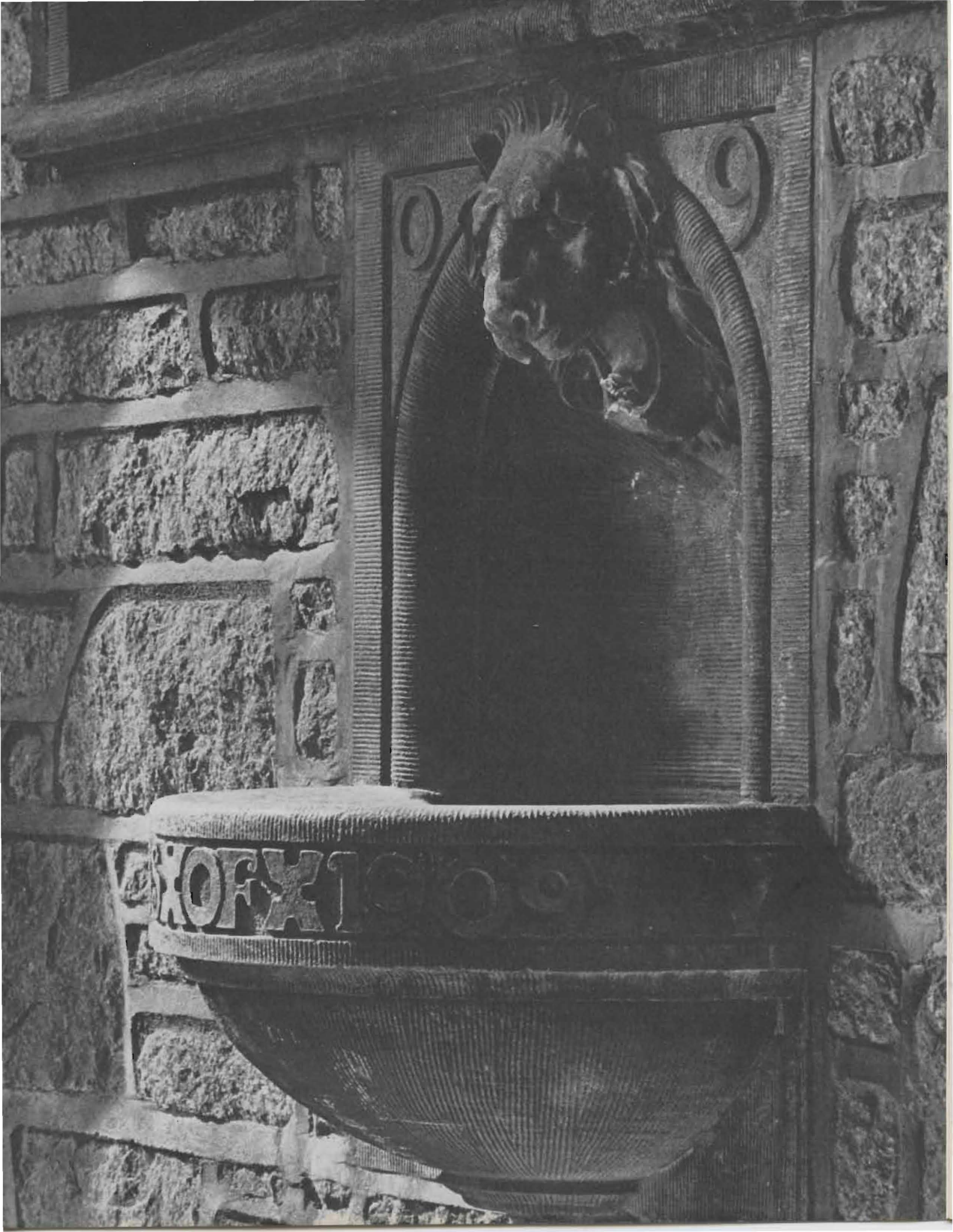
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For St. Louis the Gay Nineties was a time of fashionable town houses along Lucas Place and the erection of grand residences on private streets.

These structures were elegant evidence of fortunes made through fur trade, steamboating, real estate, manufacturing, and merchandising. Unfortunately, no such grandeur characterized the cluster of buildings around Seventeenth and Washington which constituted Washington University.

The late Dean Alexander S. Langsdorf, in his meticulously detailed history of the University, sketched the seediness of this site blighted by "dusty wooden floors, numerous partitions of tongue-and-grove lumber added as afterthoughts, dark wooden trim, and lighting fixtures so inadequate by modern standards as merely to punctuate the gloom of dark winter afternoons." Having gone steadily downhill since the death of its inspired leader William Greenleaf Eliot in 1887, the University and its small band of faculty and students somehow struggled along despite ever encroaching impoverishment.

Obviously, Washington University was in need of an extraordinary leader to save it, and fortuitously such an individual materialized in the person of Robert S. Brookings, a millionaire woodenware manufacturer. Having toyed briefly with the idea of founding his own university, he ultimately abandoned this plan and decided, instead, as he himself declared, "to retire from active business and devote all of my time and practically all my estate to re-founding Washington University."

Joining the University's Board of Directors in 1891, he became president of this group in 1895 and, by the end of the century, had managed to infuse new life and vigor into what had become an almost moribund institution. Spearheading a vigorous and successful fund raising drive, he and his former business associate, Samuel Cupples, each gave his half share in the Cupples Station properties to the University, thus increasing its endowment by "several millions of dollars."

Meanwhile, the Board initiated plans to move the University farther west, and

in 1894 purchased 110 of the acres on which the University now stands for an estimated \$185,000.

Shortly afterwards the Boston landscape architectural firm of Olmsted, Olmsted and Eliot was employed to make a site analysis and prepare a preliminary scheme. This firm was nationally renowned for the excellence of its site plans for several leading universities, including Stanford University. To those unfamiliar with Washington University's heritage, it may seem unusual that a comparatively unknown school should have looked to the very best for guidance, but such an attitude was entirely in keeping with the lofty ideals of its leaders. In his inaugural speech as Chancellor, Dr. Eliot declared forthrightly, "Our assigned task is to make for St. Louis what Harvard College is to Boston, or Yale to the city of its abode." In all probability, the great genius himself, Frederick Law Olmsted, Sr., or FLO, as his most recent biographer Laura Wood Roper calls him, did not direct the Washington University project because ill health forced his retirement in 1895, but his firm's recommendations were in the best Olmsted tradition. It is interesting to note that the Eliot involved in this work was Charles Eliot, son of a former president of Harvard, Charles W. Eliot, and uncle of a recent chancellor of this University, Thomas H. Eliot.

THE OLMSTED FIRM was impressed with the new University site and compared it with "the Acropolis of Athens, and of other Greek cities, upon which the public buildings were erected." It urged, however, that the University purchase additional land on the south side of its tract in order to permit a better balanced arrangement of buildings. It took the Board four more years to acquire some fifty additional acres at a cost of about \$3,000 an acre. This action extended the southern boundary of the Hilltop campus to what is now Forsyth Boulevard.

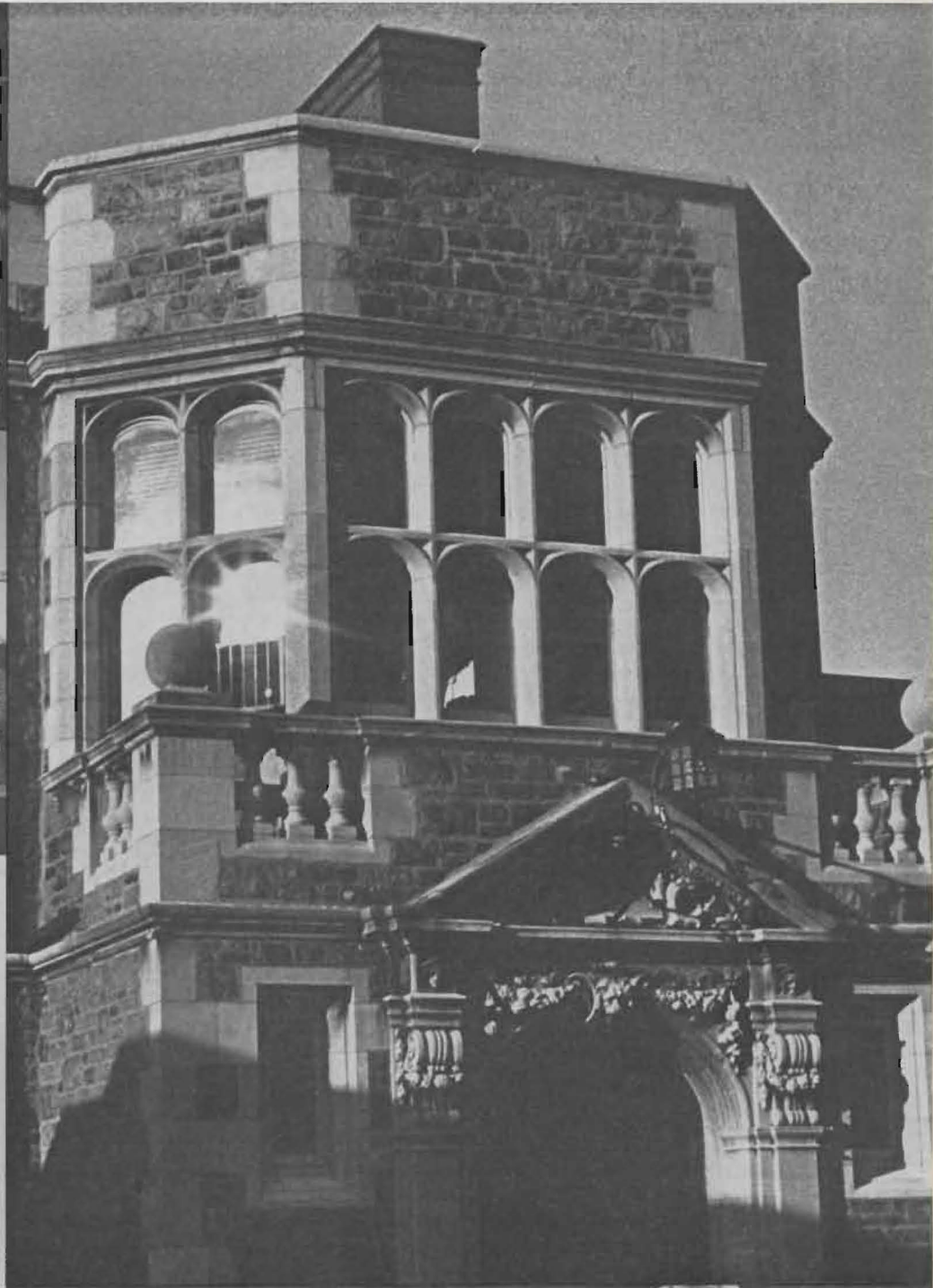
The Olmsted firm's preliminary plan, according to Washington University's former archivist Richard Lytle, "Established the administration building in a dominant position over the park and suggested a linear development of quadrangles, with the long axis of the campus running perpendicular to Skinker Road." Delighted with the projected image, the

# The Hilltop Campus

By DOROTHY BROCKHOFF

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*Seventy years ago, Washington University established its main campus on its present hilltop location just west of Forest Park. The original plan, created by the Frederick Law Olmstead firm, laid down the guidelines and provided the inspiration for the architectural development of the campus ever since. To preserve this precious architectural heritage and to continue its development is a challenge for both the University and the community.*



Board in 1899 instructed the Olmsted organization to prepare a program for an invitational competition.

This competition, which required each entrant to design both a master plan and certain specific buildings, was won by the Philadelphia firm of Cope and Stewardson, which edged out five other competitors, including some of the best architectural talent in this country. Of their plan, Professor Buford Pickens, the University's eminent architectural historian, has commented: "It was architectural genius that based the plan of spaces and buildings upon the medieval courtyard tradition of Oxford and Cambridge Colleges, a tradition that has evolved successfully from the fortress-like gateway tower (Brookings) to the open round-arch, Renaissance loggia (Ridgley). The human scale, the dominant horizontality, the physical joining of one building unit to another, and the combination of a formal axis with varied informal spaces established a heritage of planning principles which could maintain unity without endless duplication of frozen forms."

This visionary plan was actually the work of Walter Cope (his partner John Stewardson had died unexpectedly in 1896), and it was he who personally spelled out his aims in an eighteen-page brief which he read to the Board as its members viewed his competition drawings. Cope based his design on a predominant style which he called "Academic Gothic." He proposed to use it within a block plan which provided for courts or quadrangles which he visualized as "outdoor rooms with the sky for a ceiling." These ideas were based on experience which the Cope and Stewardson firm had acquired in designing academic buildings on a variety of campuses, including Bryn Mawr, the University of Pennsylvania, and Princeton.

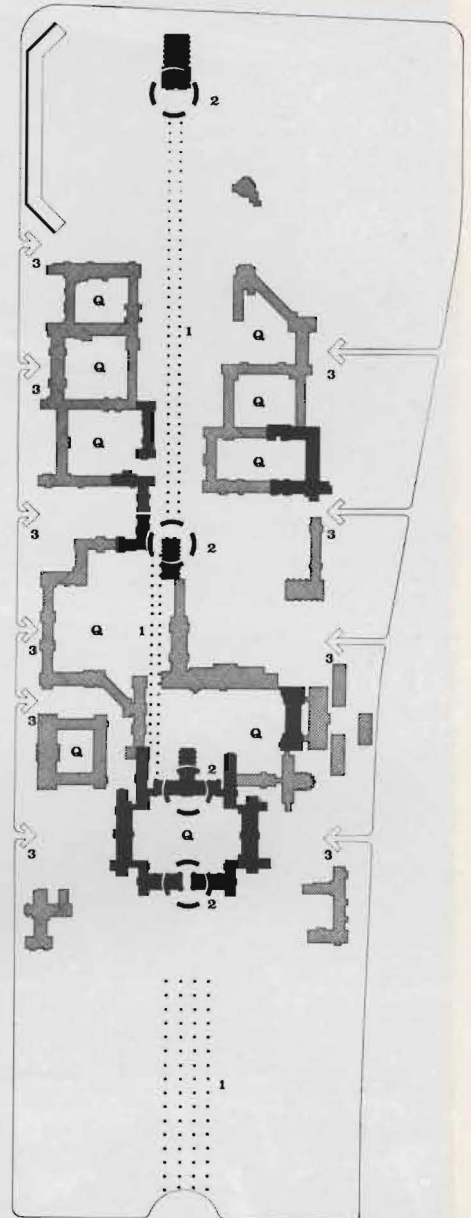
**T**O MANY St. Louisans, the whole idea of building a University beyond Forest Park in an area which was then nearly all farmland and sylvan forests must have seemed complete folly. Bounded on the east by a yellow clay artery called Skinker Road, which became a muddy mess when it rained, this tract must have seemed remote and impractical to skeptics of the day. But to those, including the Washington University di-

rectors who were canny enough to understand the logistics of St. Louis at the time, it made perfect sense. For as urban historian Glen Holt has pointed out, the University's leaders were moving in the vanguard of key churches and farsighted individuals who sensed that the northwest corridor of the city was the main growth corridor. By putting the University just off the center of this primary growth corridor and protecting its acreage by Forest Park, these sagacious men secured a prime location for the University.

**P**ROFESSOR HOLT believes that they were also influenced by the fact that this key acreage was situated on a primary streetcar line and not far from the narrow gauge suburban line. Thus, convenient transportation was available. With these factors in mind, the directors must have reasoned that the new location was ideal—far enough away from the city's bustle and yet close enough to enable the University community to enjoy its amenities and to serve its needs.

For despite the fact that most of their newly acquired property lay beyond the city limits, the University's directors had no intention of severing the strong ties which for decades had bound town and gown. Charles Nagel, in reminiscing about the largesse of key St. Louisans in response to Brookings' call for financial support, declared, "It was not like ordinary giving. It was a movement. We were all working together, building for the future of St. Louis and the Southwest; a common movement to which we were contributing. There were no strings to the gifts."

In its formative years, satellite educational institutions, including the O'Fallon Polytechnic Institute, Smith Academy, Mary Institute and the Manual Training School (all secondary schools), were connected with the University, and those facilities provided much needed instruction for many of the city's young people. Some of the University's faculty, in addition to teaching, contributed to important civic projects. William Chauvenet (Chancellor from 1862-69) was responsible for many of the mathematical calculations involved in building Eads Bridge, and engineering professor Calvin Woodward wrote a definitive book about the structure. Even the University's meager facil-



Original campus plan emphasized linked buildings to form quadrangles (Q); tree alleys (1) to define east-west axes; major buildings (2) to establish focal points; and periphery roads (3) to keep services outside the pedestrian green.



ities and equipment were pressed into service. By 1877, its observatory was doing work for both students and the faculty, according to William Greenleaf Eliot's biographer. She recounts that its electric clock for some years "regulated not only the time for the city but for several railroad systems."

While the first five University buildings—Busch Hall, University Hall (renamed Brookings Hall in 1928), Cupples I and II, and the original Liggett Hall—were being erected in 1900-01 with funds contributed by generous donors, including another \$200,000 gift from Mr. Brookings, the directors saw a chance to take advantage of an unprecedented opportunity. Aware of the fact that the city fathers were making plans to hold the Louisiana Purchase Exposition (St. Louis World's Fair) in the western half of Forest Park and adjacent acreage, Mr. Brookings seized the opportunity to lease these buildings and the new campus to the Fair management for \$750,000. With the proceeds, Washington University was able to construct Francis Gymnasium, the adjoining Francis Field facilities, and Tower Hall, later renamed Lee Hall. Eads Hall, which went up at the same time, was made possible by a generous gift from Mrs. Eliza A. How, daughter of the famed engineer, James Buchanan Eads.

**B**Y THE TIME the Fair opened on April 30, 1904, these buildings formed an attractive architectural core, but the surrounding campus was barren. Perhaps the euphoria of the Exposition and the enormous quantities of sparkling champagne uncorked in Brookings 202, the bar-room, made many Fair visitors oblivious to the bleakness, but it did not go unnoticed among the University community, who stood impatiently waiting in the wings for what Henry Adams called "this marvelous phantasm" to close in December.

Nothing could be done about the barren grounds when the University community was finally able to move into its new quarters on January 30, 1905, but come April, Dean Woodward, nostalgic for the Harvard elms, proclaimed an Arbor Day. Many of the saplings planted then are the sturdy elms, maples, and pin oaks which canopy the campus walks today.



They were planted on a surface which had been laboriously changed from a place of natural farm field slopes to the shape seen today. A million cubic yards of earth were moved during the grading operation as a twelve-foot fill on the Quadrangle, and a 30-foot fill at the Lee and Liggett sites raised these places to their present levels. A calamity was narrowly averted when precious topsoil was rescued from well-meaning, but uninformed volunteers, who had begun filling sandbags at the project to help stem the "June Rise" of the Missouri in '02. Later, much of this same soil was lost when World's Fair gardeners scooped it up to make flower beds. As a result, Dean Langsdorf reported, "The campus clay and hardpan had to be nursed for years thereafter by sowing oats and beans until grass would grow."

More trouble developed when property owners on the south side of Forsyth became contentious when they learned that the grade level of this roadway would have to be altered as a result of the campus excavation. A real Donnybrook resulted which, according to James P. Jamieson, resident architect for Cope and Stewardson at the time and later a designer of University buildings himself, brought the University directors, the Chancellor, and President Brookings "to the end of their rope." At this climactic moment Adolphus Busch, Sr., proposed that a syndicate of a few Board members buy the 30 or 40 acres involved, "so that they could do what they pleased with this road." Everyone agreed and the problem was solved.

Another controversy over building materials was settled when the University's entire Board trooped to the Vandeventer Avenue headquarters of the Pickel Stone Company to choose from several mock-up walls. Missouri red granite nosed out brick. The "laying up" of the granite walls required special knowledge, and the stone masons on the job were given cards with ten specific instructions. Jamieson reports that "these rules were, of course, soon known as the Ten Commandments and were quite as frequently broken as the Biblical originals." Many of these seasoned craftsmen became even more disenchanted when a young member of the architectural firm appeared on the site in a white shirt

to direct their endeavors, and a few actually quit.

Despite all of these irritations, however, the work progressed on schedule and the buildings which were created are a tribute to the creative genius of Cope and the labors of all who toiled so faithfully on the project. Professor Pickens said recently that he believed no other college or university in the nation could boast of having eleven buildings designed by the same architect. "It was," he concluded, "an auspicious beginning."

UNFORTUNATELY, Walter Cope did not live to see the last of his buildings completed in 1907. He had died five years earlier of a heart attack brought on, Professor Pickens suspects, by overwork. The task also exhausted its builders and, as Professor Robert Vickery, a former campus planner and now on the faculty of the University of Virginia, has pointed out: "Not until 1922, when Duncker and January Halls were started, did construction begin again, and these were the last buildings to follow the 1899 scheme." Over the years "Academic Gothic" has been succeeded by a variety of eclectic styles, but Constantine E. Michaelides, Dean of the School of Architecture and chairman of the campus planning committee, stressed that certain key principles of the Cope and Stewardson plan have been retained.

The University on its east-west axis has continued to construct buildings which have been deliberately designed to appear only a few stories tall because of recessed roofs. One of the most imaginative and critically acclaimed buildings on the campus, Olin Library, programmed by Professor Pickens, himself a campus planner at the time, is a case in point. To keep it in scale, its designers, Murphy and Mackey, winners of another University-sponsored invitational architecture competition, sank two of its levels underground.

Cope and Stewardson tradition accounts for the continuity in the growth of the campus, Dean Michaelides continued. The principle of constructing long and narrow buildings which enclose open spaces has been retained throughout recent campus expansion. The plaza between the Seeley G. Mudd Law Building and Thomas H. Eliot Hall, Millstone





Plaza between Bryan Hall and the George F. McMillen Laboratory, and Bowles Plaza, the attractive courtyard between Mallinckrodt Center and Karl D. Umrath Hall, are charming oases which reflect the quadrangle theme.

Dean Michaelides and Professor Pickens both emphasized also that Cope's plan prevented vehicular traffic in the heart of the campus. This feature turned out to be providential when the automobile came into common usage. Service areas have been placed on the edges of the Hilltop campus, making it possible to stroll from one end to the other without ever crossing a street. Moreover, stately columns of trees have continued to be planted to arch the pathways.

Finally, Dean Michaelides called attention to what he considers an important contemporary contribution to Cope's basic plan: the separation of academic and residential buildings. Beginning in the 1950's, the dormitories were separated from the rest of the campus and moved to a tract called the South Forty just off Wydown Boulevard. This expansion was necessary because of the University's decision to make an extensive effort to recruit students throughout the country and from abroad. Identified now as the residence area, this sixteen-building complex is linked to the Hill itself by an underpass beneath Forsyth. These buildings are a symbol of the truly international character of the student body.

**T**HE END RESULT is a picture postcard campus with quaintly old-fashioned buildings juxtaposed against sleek structures of the seventies in an integrated whole which is entrancing to behold and a delight to encounter at an urban university.

Of all of the forty-nine buildings constructed during the past seventeen years, undoubtedly Mallinckrodt Center is the most used by students, faculty, staff, and alumni as well as the community at large. Designed by Smith and Entzeroth in association with Vickery, it houses the Edison Theatre, studios, cafeteria, book store, lounges, and offices. One of Mallinckrodt Center's most spectacular features is the three-story Shoenberg Gallery which opens to Bowles Plaza through a glass wall and extends from the basement level to the roof. This gal-



lery has been characterized by *St. Louis Post-Dispatch* art editor George McCue, as "a great scene." Erected at a cost of some five million dollars, the center is part of the \$63,133,261 total investment which the University has made in new buildings during the period 1957-1974.

This new construction has complemented an extensive program of renovation. Work commenced in earnest in the early sixties with the conversion of two dormitories, McMillan Hall and Liggett (now Prince), into academic structures. At about the same time, Lee Hall was transformed into Karl D. Umrath Hall, a center for services and student offices. The name of John F. Lee was transferred to one of the new residence halls in the South Forty.

**O**VER THE passing years, renovation has become one of the top priorities at the University, with the result that the list of projects completed is too long to enumerate. Most of the remodeling has involved altering the interiors of buildings to meet changing academic needs and the necessity for more classroom and office space. Duncker Hall, long the headquarters for the School of Business and Public Administration, is now the home of the English department. Business has moved to Prince. Cupples I shelters the mathematics department and some miscellaneous services. Brookings Hall has been extensively remodeled to accommodate the office of the central administration and supporting staff.

Renovation of older buildings is not easy, but it is worthwhile. Remodeling costs are approximately one-third to one-half the cost of erecting new facilities. Major renovation projects often require that workmen gut the building. Antiquated steam pipes, old electric wiring, and gas lines are either replaced or relocated. Walls are sometimes water-proofed and old floors ripped out.

One of the most popular of recently renovated facilities is the former Ridgley Library's main reading room which was converted into a commons called Mary Brooks Holmes Lounge. The scene of a gala West Point cadet ball during World's Fair days, it is now a comfortable, spacious place which serves a dual purpose. It is used to chat with friends over a cup of coffee served in a real

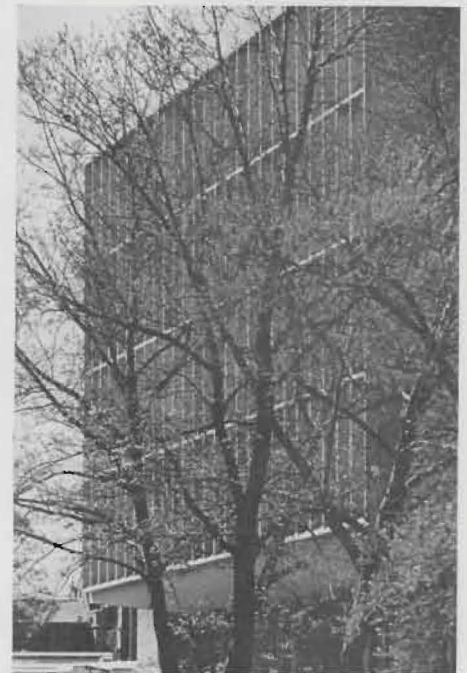
china cup and as an informal extension of the classroom where students and faculty meet to exchange ideas. Professor Pickens believes that this commodious lounge is perhaps the best example of English Georgian architecture in the Midwest. The hand-carved oak in the room and the elegant fireplace give it a gracious warmth which is difficult to duplicate in modern buildings.

Old grads who were used to the formality of the Ridgley reading room are often brought up short by the casualness and conversational buzz in the lounge. Once they shed a nostalgic tear or two, however, their longing for the good old days disappears and is replaced by pleasure and delight with a lounge which is as distinctive as the University itself.

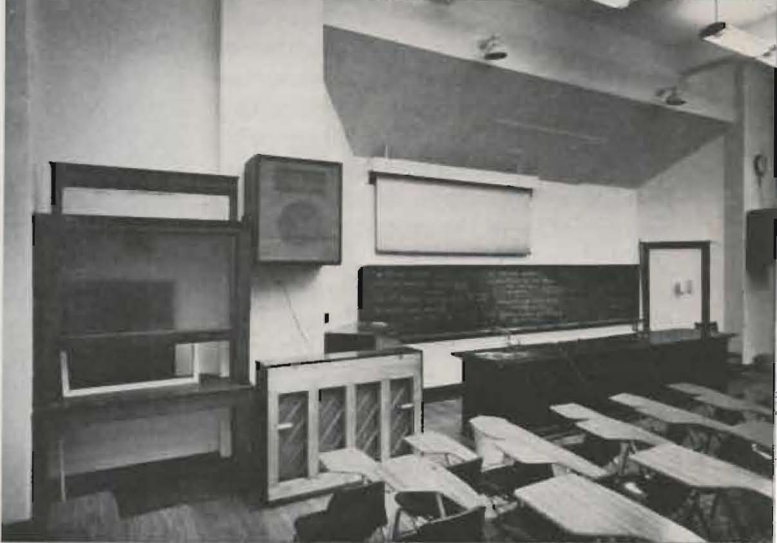
Meanwhile, the University continues to seek new ways to improve the campus environment. A grant from the St. Louis Regional Planning and Construction Foundation has financed several studies, including one to improve the exterior lighting on campus. Out of it developed a pilot project devised by Hellmuth, Obata & Kassabaum, Inc. Nearing completion as this article was being prepared, the aim of this trial project is to improve visibility at night without turning the campus into something resembling a department store parking lot.

Over the past seventy years Washington University has become a nationally recognized center for education and research and has undergone significant architectural growth. During the same period the St. Louis area community, which has contributed generously to the University's development, has itself undergone dramatic changes. New residential, commercial, and industrial centers have shifted westward. The University now finds itself at the heart of a resurgence of metropolitan change.

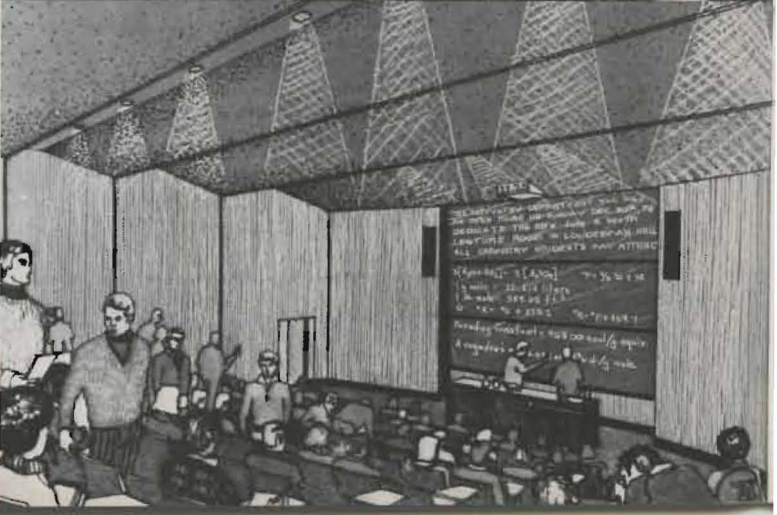
**F**ORTUNATELY, however, there are architectural landmarks which do not change in the community—the famous stone lions proudly guard the gateway to University City and the venerable Hanley House lends character to Clayton. At Washington University the majestic view of the city is still framed by the Brookings arch, and the gargoyles continue to watch over a campus cherished for its beauty.



Reconstruction of structurally sound older buildings to meet new campus needs has been a successful development plan. At right, above, is the reading room of the old Ridgley Library; below is the same beautiful room remodeled to serve as the popular campus gathering spot, the Mary Brooks Holmes Lounge.



Much renovation of older buildings, particularly those housing classroom facilities is urgently needed. At right, above, the outdated large lecture room in Busch Hall; below, artist's conception of modernized version of the same room.



## Looking To The Future

## The Hilltop Campus

**T**O MAINTAIN the quality of its educational programs, Washington University must strive to make the most of its physical facilities and to prepare to take advantage of tomorrow's opportunities.

Renovation of structurally sound older buildings coupled with construction of new academic halls is required to serve the educational needs of the University. All sorts of vital building improvements are necessary to modernize structures which must be altered as the original purposes for which they were designed change. So Busch Hall, abandoned by the chemistry department in favor of more modern and efficient facilities in McMillen Laboratory and Louderman Hall, is slowly being shaped to meet the needs of three other departments: history, philosophy, and Chinese and Japanese studies, as money for renovation becomes available.

At the present time, Busch Hall's large lecture room is difficult to use efficiently because it is poorly ventilated, dimly lighted, and outdated. Revitalization of this accommodation together with modernization of other parts of this structure, the first to be built on the campus, is one of the goals of the five-million-dollar master plan for renewal of physical facilities on the Hilltop site.

Other projects of prime importance include the renovation of the much used large lecture rooms in Wilson, Louderman, and Brown Halls, the completion of south Ridgley Hall for new occupants, including the German department, and the opening up of much needed space in January Hall for the School of Continuing Education.

A gift of one million dollars will provide for complete renovation of a number of entire buildings to ensure their service for another seventy years. A contribution of \$500,000 will finance the modernization and air conditioning of nine lecture halls urgently in need of attention. Gifts of \$25,000 to \$75,000 will enable the University to remodel individual classrooms. Such renovated areas may be named in honor of the donor or as a permanent tribute or memorial to a family member or friend.

Additional space is badly needed in the biology department on the Hill and in the Law School. To relieve the first problem, a three-story life sciences building is nearing completion on the Forsyth side of the campus. Designed by Hoffmann, Saur and Associates, Inc., this structure will house a two-level library, a large greenhouse and facilities for animals used in research projects. The present biology library with its holdings of some 28,000 bound volumes is cramped and crowded. In its new quarters, it will be able to accommodate some 50,000 bound volumes—necessary to keep pace with scientific progress and discovery.

The greenhouse will be visually integrated with the library, which will have a glass wall fronting on a courtyard separating it from the connecting Adolphus Busch III Laboratory of Biology. Gift support is being sought for this building which will cost more than \$800,000. Additional funds are needed for the remodeling of Rebstock Hall, a center for biological research and classrooms.

**D**EDICATED in April, 1972, the Seeley G. Mudd Law Building and its Eugene A. and Adlyne Freund Law Library have already outgrown their quarters as more and more students aspire to become lawyers. Its designers, Schnebli, Anselevicius, Montgomery, Rupe and Matter, provided for expansion on the Millbrook side of the Mudd building, and at the present time workmen are busy filling in this core of the structure and adding a northern wing. These new facilities will enable the Law School to support a student body of some 550 comfortably for years to come and to expand its library by some 40,000 volumes to an overall total of 200,000 volumes. New classrooms and faculty offices will round out the new portion of the Mudd building. Gifts of one million dollars are needed for the addition; construction is proceeding under interim financing, Law School reserves, and unrestricted funds.

Washington University's architectural heritage is a bequest from the past to the future. Its beauty and distinctiveness are testimony to the bold, wise, and generous leadership of men and women with creative imagination. Their example is an inspiration for all of us to emulate as this University continues to develop its facilities to meet the needs of today's students and the generations who will come after them.



The new life sciences building now under construction on the Forsyth side of campus will provide badly needed biological research and library facilities.

# M.D./Ph.D. Program

By ROGER SIGNOR

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*Last fall approximately 400 students applied for eight openings in the School of Medicine's M.D./Ph.D. program in which a student receives both degrees after six years of study. A basic premise of this and similar programs to train "academic physicians" is that future cures or ways to prevent disease will spring from basic medical research.*

WASHINGTON UNIVERSITY has been no exception to the national enrollment trend in which larger numbers of students are seeking admission to medical school. The University currently has an estimated 850 premedical students, which is a record enrollment. The vast majority of medical school graduates will enter one of twenty-two recognized medical practice specialties; at the same time, many students are showing interest in the newly established specialty of family medicine, which, hopefully, will help to meet the demand for so-called primary care physicians.

A minority of medical students, however, continues to opt for roles as academic physicians—specialists who staff faculties at large, teaching-hospital complexes, such as the Washington University Medical Center. Academic physicians at the center spend from 25 to 40 per cent of their time seeing patients, usually as consultants, but, the bulk of their time is devoted to research and teaching.

Acting on a proposal by Professor Roy Vagelos, Washington University's School of Medicine began a joint M.D./Ph.D. program in 1968 to provide optimal training for potential academic physicians, both in terms of the depth of their research and their exposure to a variety of medical problems. The M.D./Ph.D. program's forty-seven students are part of the medical school's 541-member student body. The program has its own director, Luis Glaser, who received his Ph.D. in biochemistry from Washington University in 1956.

For the first two years of study, M.D./Ph.D. students take the same medical courses as other medical students. "During this period the students also try their hand at various research projects during the school year and summers. At the end of the second year they must choose a particular research field and a faculty

member with whom they'd like to work," Dr. Glaser said. "Most students are clear about what they want; for a few it's more of a soul-searching process." The fourth through the fifth years of study are spent in intensive research to fulfill requirements for the Ph.D. During the sixth year, the students ordinarily do clinical training as interns, seeing patients in the usual ward-rotation system with other medical students.

"In effect, what the M.D./Ph.D. program does," Dr. Glaser continued, "is simply take the fourth year of medical school—which can be used for research as an elective by all medical students—and add two additional years of study for the Ph.D. before the student goes on to complete his M.D. requirements as an intern. Graduates usually take an additional year of postdoctoral study before seeking a staff position at a medical center. Of course, it requires dedication to commit yourself to those extra years of work; but I think most students have found that it is a more ideal approach to a career in academic medicine."

DR. GLASER pointed out that the traditional training pattern for academic physicians has been to earn a medical degree, then pursue one or more years in postdoctoral fellowships to gain depth of knowledge in a special field of research. "This, of course, assumes that you'll find the right postdoctoral spot to coincide with your interests—and, obviously, many individuals have succeeded," he said. "The basic advantage of a joint M.D./Ph.D. program at a large medical center such as this one is that within your field you should get a broader perspective. If your main research training has been in postdoctoral work, it will tend to be much more specialized. But research frontiers often broaden or shift, and the overly specialized person

*Ellen Li, a first-year student in the M.D./Ph.D. program who holds a Mr. and Mrs. Spencer T. Olin Fellowship, said, "There will be a tremendous payoff in medicine if we understand the molecular biology for the normal functions of a cell. Then we can know better how to attack abnormal processes."*



could find his options severely limited," Dr. Glaser added.

He pointed out that there is heavy competition for the eight annual openings in the M.D./Ph.D. program. Last fall, about 400 students applied for the eight positions. Students who are accepted receive their tuition and stipends for fees and living expenses. Originally, the program was completely funded by the federal government's National Institutes of Health. The NIH has been phasing out its funding of M.D./Ph.D. programs as part of the general cutback in federal support of medical school programs, although recently the NIH has reconsidered the question of M.D./Ph.D. cutbacks. Washington University, however, has made a commitment to continue its M.D./Ph.D. program, which today is one of only two or three still in existence.

**T**HE UNIVERSITY'S commitment is based largely on the fact that cures or ways to prevent disease spring from basic medical research. "The great advances in clinical medicine in the past 100 years," Dr. Glaser said, "have been the culmination of years of painstaking research—usually interdependent studies by a number of scientists. One good example is in the area of kidney transplants," he continued. "Most laymen think it is simply a surgical technique, but kidney transplants were made possible only by the fruits of more than twenty years of basic immunological research. Scientists in immunology gave clinicians both the ability to match tissues properly and the immuno-suppressant drugs that have resulted in a greater than 50 per cent success rate in kidney transplants. The basic research behind these advances tends to be taken for granted, but it is the foundation of so-called modern medicine."

Basic medical research will be an im-

*Myra Collins, who is completing her Ph.D. thesis, said, "I think the M.D./Ph.D. program will make me a better teacher who can relate more effectively to both medical and graduate students."*



portant part of the work of almost all graduates of the M.D./Ph.D. program. As a matter of fact, nearly all of the students in the program had been scientifically oriented to the extent that they were heavily involved in research as undergraduates.

**O**NE OF THE FIRST to enroll in the Washington University program was Myra Collins, who is now writing her Ph.D. thesis. As a child, she lived on a farm near Marshville, North Carolina. "You're always close to biology on a farm, and my original interest in science was really developed by my father, who had a great natural curiosity. I entered Duke University, where I was lucky enough to get a job in the lab of Jack Kostyo, a cell physiologist, who was interested in how growth hormone works in muscle tissue. It was one of the wisest decisions I've ever made. It was the first time I worked in a lab setting to learn something that had always fascinated me—how molecules interact to eventually have a profound effect on cell metabolism. The people at Duke spent hours of their spare time discussing research; I found out from them how much fun research is."

"I dreamed of someday being able to see the molecular events behind the changes in a cell's metabolism. So, it's not surprising that I've ended up in electron microscopy. The electron microscope has many uses, but one of the best known applications has been the identification of viruses. The EM can delineate the characteristic structure of a given virus, and most major medical centers use EM's routinely to do this. I've studied various large molecules—protein and nucleic acid molecules—but I'm now interested in two problems. One is to find the EM's viewing limitations

which are imposed by its intense radiation. It would be helpful to know just how much of what you see is altered by radiation. Beyond the problem of radiation, I'm interested in understanding all I can about the physics of the EM, so that I can better interpret the many kinds of data it produces."

Instead of doing a year of internship in medical wards, Ms Collins will take a postdoctoral fellowship because of her decision to pursue biophysical research with the electron microscope. Then she hopes to join a medical school faculty. "I think the M.D./Ph.D. program will make me a better teacher who can relate more effectively to both medical and graduate students. I've had a much broader background in medicine and science, one that I probably wouldn't have had from a purely medical or graduate school education," she said.

**T**HE TWO graduates of the Washington University M.D./Ph.D. program, Dr. Wesley Murfin and Dr. Richard Jacobs, are serving medical internships at Washington University Medical Center's Jewish Hospital and the University of California—San Francisco Medical Center's Moffitt Hospital, respectively. Typical of interns, Dr. Murfin was on duty last Christmas, much to the disappointment of his wife and three-year-old child. Despite his schedule, Dr. Murfin said, "I've enjoyed working in the wards and I wouldn't mind taking care of patients on a full-time basis. You don't really know what medical care is until you get a chance to take care of patients yourself. Of course, you see a lot of patients in medical school, but you're not responsible for making decisions about a patient.

"But knowing my own preferences, I don't think I'll end up as a primary



care physician. I'll probably go into pre-clinical research after a year of residency. My research field will be in metabolism or endocrinology, and my contact with patients will be limited to that of consultant. I don't think that people who go into research seriously have the time to be a primary care doctor and researcher. An exception was Professor Carl Moore, who was outstanding in both fields. My father, who is a surgeon in my home town, Decatur, Illinois, also studied under Dr. Moore. That was during World War II, and Dr. Moore was one of a very few people here on the full-time faculty. He taught just about everything and took care of patients, too." (Dr. Carl V. Moore, chairman of the Department of Medicine, died two years ago.)

Dr. Murfin said his interest in research was kindled at Washington and Lee University, Virginia, "by an outstanding chemistry department. For awhile I considered becoming a chemist. After graduation, I got a summer job at Washington University, assisting in biochemical research in the psychiatry department. I wanted to enter medical school here, but I also wanted to continue research. When I found out about the M.D./Ph.D. program, I enrolled because it let me do both."

**E**LLEN LI, a Stanford University graduate who received a Mr. and Mrs. Spencer T. Olin Fellowship last fall to enter the M.D./Ph.D. program, said, "It was the way in which the program integrates medicine and research that attracted me. I had a difficult time choosing between Washington and another university which also has an excellent medical school. But the other school has more of a dichotomy between research and medicine—first, you do all your Ph.D. work, then you start on your

*An intern at St. Louis Jewish Hospital, Dr. Wesley Murfin took a summer research job at Washington University after earning his bachelor's degree. "I wanted to enter medical school here," he said, "but I also wanted to continue research. When I found out about the M.D./Ph.D. program, I enrolled because it let me do both."*



medical studies.

"Although my hometown is Chicago, I loved Stanford and my four years there went by very fast," Ms Li continued. "There are students from Stanford in the M.D./Ph.D. program as well as kids from many other good schools, including Harvard, Berkeley, Princeton, Cornell, and Delaware. So, it's a good group and I haven't had any problems adjusting. The medical curriculum is straightforward, but I know that the crunch will come when I settle into my Ph.D. research project. So far I've worked in Dr. Vagelos's lab on studies involving membranes of embryonic muscle cells. This summer, I'll return to that lab and work with a postdoctoral fellow whose speciality is cell membranes. It's still up in the air as far as what field I'll specialize in or what balance I'd prefer in practicing medicine and doing research. Some people say that one or the other will suffer if you try to do both, but I think that will depend on how successful you are in finding the right combination. This program should help in that respect because it will give you a broad perspective."

**D**URING THIS school year, Ms Li said that her class had had special meetings with professors from various medical school divisions and with several guest speakers. After lectures, informal gatherings are held with the M.D./Ph.D. students. "We've been able to meet some very good people," Ms Li said. "Also, last semester each of us did a special reading project in biochemistry. I concentrated on literature about RNA tumor viruses. I had to give a short talk on my understanding of a specific problem in this literature and then receive critiques from my classmates and teachers.

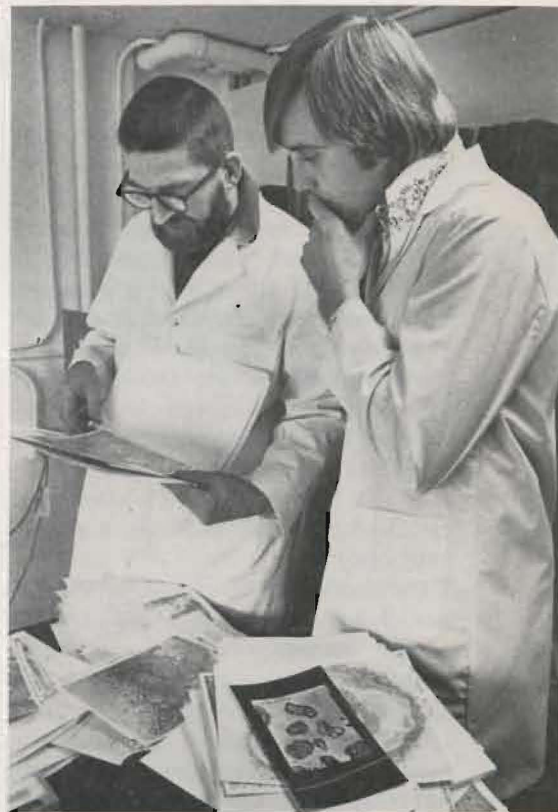
"Biochemical processes are so complex that it's extremely hard to get clear-cut

answers," she continued, "but that doesn't mean you shouldn't try. There will be a tremendous pay-off in medicine if we understand the molecular biology for the normal functions of a cell. Then we can know better how to attack abnormal processes."

**T**HE LATTER point was also emphasized by Michael Nelson, a fourth-year student, who attended Cornell College in Iowa. He has chosen for his research project the study of how the normal human placenta functions to keep the fetus alive during pregnancy. "A lot of papers have been published on this subject, but the fact is that the normal process of how the placenta does this isn't understood. If we did understand it, that would open the door to understanding abnormal functions. Research is intriguing because you're at the center of discoveries. It's exciting to be a part of this whether you're in my speciality in obstetrics, or in the field of cancer, where there is plenty of activity now from greatly increased federal funding." (Mr. Nelson's wife is a nurse who works with cancer patients in the medical school's Wohl Clinics.)

Born in Oneida, Illinois, Mr. Nelson said, "I've been interested in some form of science since I was a kid. My high school was small, but I took every science course they had. I attended a small liberal arts college where in my senior year I decided to enter medical school. I applied to five schools which had combined degree programs in one form or another. At the time, Washington University was the only one that was funded by the NIH. But the thing that attracted me to this program was the interest people showed in me. No one made me feel that taking time out from their work to talk to me was a burden. At other schools professors gave you the feeling

*Fourth-year student Michael Nelson said, "What attracted me to this program was the interest people showed in me. No one made me feel that taking time to talk to me was a burden."*



that just going over your application was a favor. I hope in 1977 to go to a university center in a residency program, although I'm not sure what I'd concentrate on at that time. I want to practice medicine and do research. This is one university center I'd consider, for sure."

A sixth-year student from Memphis, Tennessee, James Douglas, applied to six medical schools after his graduation from Dartmouth College, but Washington University was the only school with a combined degree program. "My sophomore biology teacher, a molecular geneticist, had heard about the program here and showed me the medical school catalog. Everything I'd heard about the University was positive and the fact that it

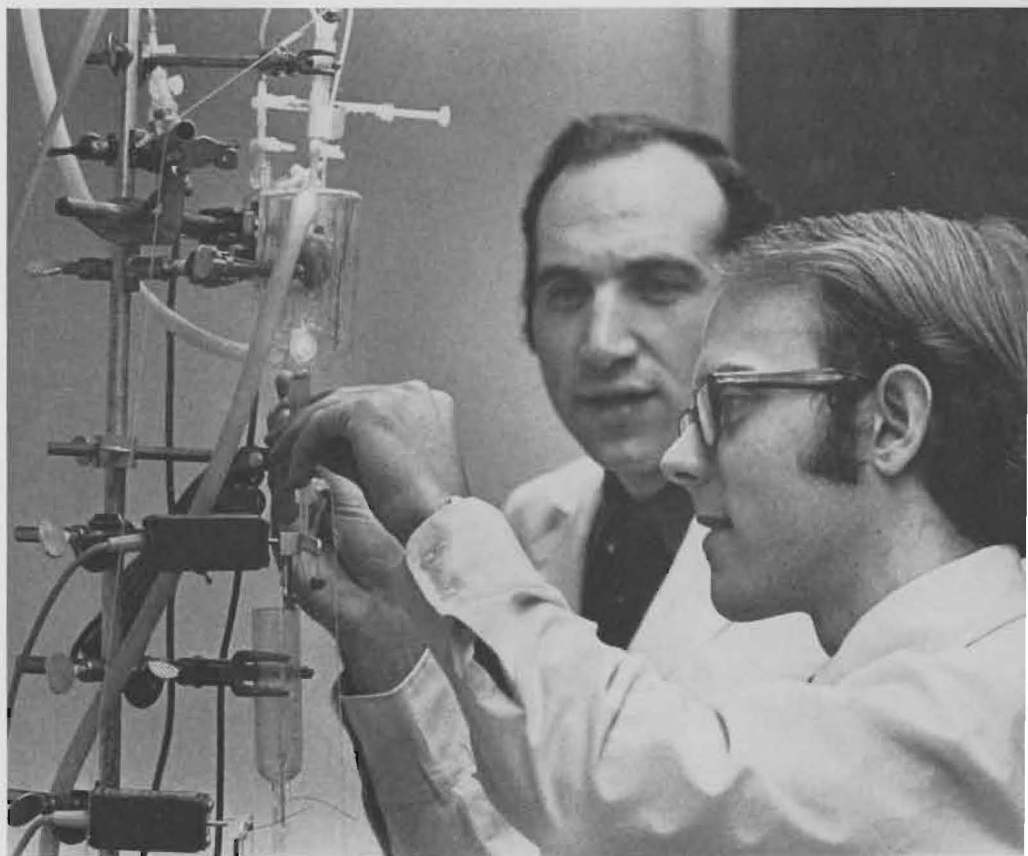
was located in the Midwest was important because of where I live."

In January, Mr. Douglas defended his Ph.D. thesis on the roles of the hormone, angiotensin, and the sympathetic nervous system in high blood pressure. He has helped to develop laboratory animal models that elucidate the interplay between the hormone and the sympathetic nervous system. In his research project, rats were used for laboratory models because it is possible to induce in them a form of high blood pressure (renal hypertension) which originates in the kidneys and is similar to the same condition in humans. "In our models," Mr. Douglas said, "we've developed a way to eliminate the sympathetic nervous system, allowing us to find out whether the system is necessary in order for renal hypertension to occur. The new models also enabled us to determine the effect of the absence of the sympathetic nervous system on the role played by the hormone, angiotensin.

"With future studies using these models, a better understanding may be gained of the basic biological processes involved in renal hypertension," he continued. "This could lead to the development of improved forms of therapy." Following graduation, Mr. Douglas hopes to go into medical research in the area of cardiovascular disease.

**T**HE RESEARCH steps achieved by Mr. Douglas and others in his field will often lead to a rational questioning and then an altering for the better of accepted medical practices. "Without this process of constant questioning and reevaluation in medicine," Dr. Glaser concluded, "the art of medical care would stagnate."

*Sixth-year student James Douglas has defended his Ph.D. thesis on the roles of a specific hormone and the sympathetic nervous system in high blood pressure. Director of the M.D./Ph.D. program, Dr. Luis Glaser, said, "Without this process of constant questioning and reevaluation, the art of medical care would stagnate."*





# McDonnell Center for The Space Sciences

By ROGER SIGNOR

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A gift of \$4 million from the McDonnell Aerospace Foundation will establish at Washington University the base for a world center of research and teaching in the space sciences.

ON NOVEMBER 27, 1974, James S. McDonnell, president of the McDonnell Aerospace Foundation, announced that Washington University will receive gifts over the next four years of \$4,000,000 from the Foundation to establish a center for space sciences.

In accepting the gift, Chancellor William H. Danforth said that it would enable the University to become "one of a handful of select institutions which will help mold man's understanding of the origins and nature of the universe." Dr. Danforth pointed out that in 1966, with the support of J. S. McDonnell, space sciences at the University were expanded considerably with the formation of the Laboratory for Space Physics. The Laboratory, under the direction of McDonnell Professor Robert M. Walker, was one of the original research groups to study the first samples of rocks brought to earth by the Apollo astronauts. The laboratory has remained one of the leaders in the analysis of the lunar samples from the Apollo missions.

Professor Walker, who has been named director of the new University space sciences center—to be called the McDonnell Center for the Space Sciences—praised Mr. McDonnell and the McDonnell Aerospace Foundation "for their vision in making possible a world center of teaching and research which will keep St. Louis in the forefront of the exploration of space. The new center will unite scientists of very different backgrounds and should lead to new directions in the study of the universe," he said. The center will include about seven new full-time professors, plus the equivalent of two full-time faculty members each year through a program of visiting scientists, and ten full-time graduate students. In addition, the McDonnell professorship, which has been sup-

ported for the past eight years by the McDonnell Aerospace Foundation, now will be fully endowed.

"We will find the best individuals for these positions and they will be distributed over several University departments in keeping with the center's interdisciplinary nature," Dr. Walker added.

Washington University has a scholarly tradition in the space sciences which dates back to shortly after World War II, when a cosmic-ray physics group was established with the help of the late Arthur Holly Compton. A former chancellor of the University, Dr. Compton was a physicist whose experiments in the early 1920's at the University showed that X-rays behave as both waves and particles—work which brought him a Nobel Prize in 1927. It isn't as widely known that Dr. Compton had a hand in organizing one of the first research groups in the world to measure variations in the intensity of cosmic radiation globally.

**D**URING THE PAST three decades, Washington University physicists have been among the world leaders in the study of cosmic rays, which are high-energy atomic nuclei that for the most part originate from points far out in space and are the earth's only material contact with the vast reaches of the universe beyond the solar system. The new McDonnell Center will build on existing foundations in fields such as cosmic ray and lunar analysis to become broader in scope and better equipped to address the following basic questions which face space scientists.

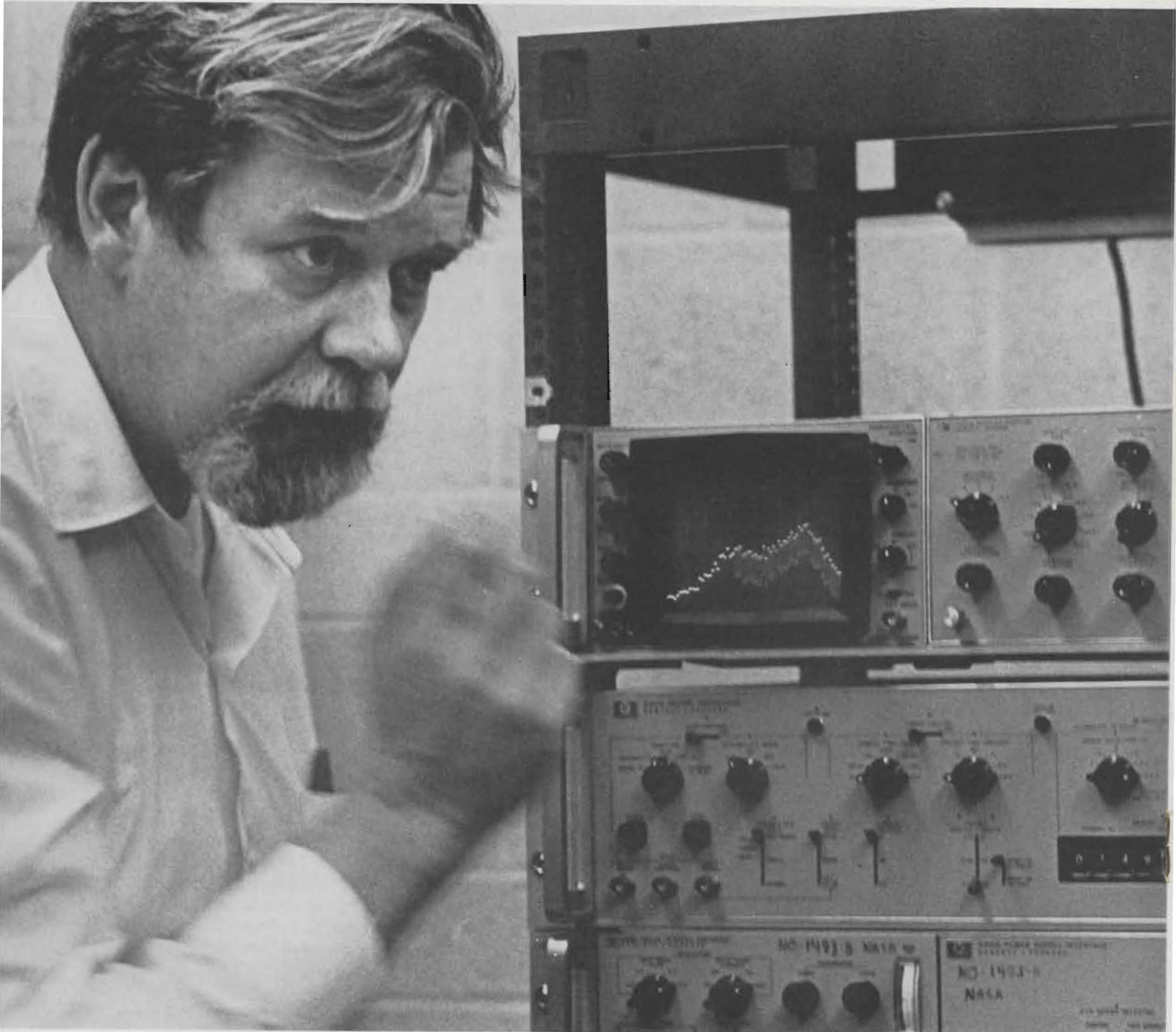
Where do cosmic rays come from and what can they tell us about the universe outside the solar system?

What is the nature of the moon and what is its history?

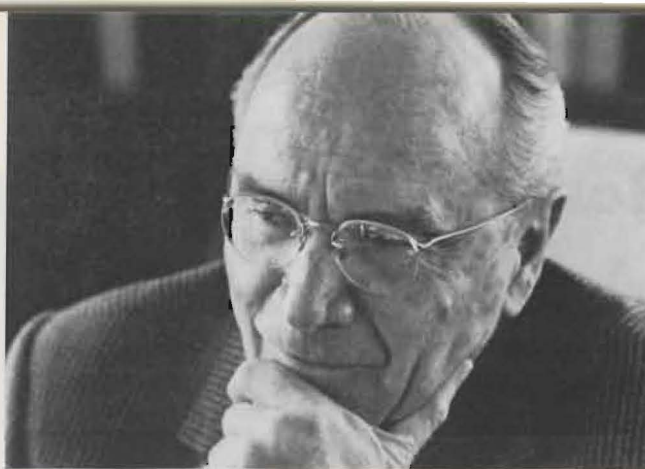
How and when were the chemical elements formed?

McDonnell Center

Below: Robert M. Walker, McDonnell Professor of Physics, has been named director of the space center.



James S. McDonnell, president of the McDonnell Aerospace Foundation, whose gift established the new center.



How and when did the solar system originate?

What is the structure of the sun and the nature of the sporadic violent outbursts that occur on its surface?

How did the planets form and what are they really like?

What has happened to the solar system in its travels several tens of times around the galaxy since its beginning?

**B**EFORE DESCRIBING some of the recent contributions by Washington University space scientists who have been working in fields which address aspects of the above questions, it is helpful to review current astrophysical theory. It is believed that many of the chemical elements must have been formed in a period of seconds in spectacular explosions of stars. In addition to producing the common 92 elements that are found on earth, these explosions must also have produced other radioactive elements that have been produced by scientists in their laboratories. One particularly important such element is plutonium. Although formed in the original explosions, elements like plutonium have long since decayed through their radioactivity and are now extinct. Solid objects which were formed when such elements were present, however, continue to show evidence of their prior existence.

Washington University space scientists have been pioneers in the study of these extinct isotope effects in meteorites and lunar samples. They have helped to define the conditions that produced the heritage of elements which make up the solar system. Extinct isotope effects also allow fine-scale measurement of the early chronology of the solar system and the mechanism of planet formation.

The University's Laboratory for Space Physics was the first to find evidence for the prior existence of extinct isotopes in the lunar samples, and its scientists are

currently working to fill the enigmatic gap in the history of the moon from four to 4.6 billion years ago. This gap, indicating a period of great cataclysms in the early history of the solar system, is one of the most interesting and puzzling discoveries of the Apollo program.

The same violent explosions that have been invoked to explain the formation of the heavy chemical elements also are thought to be responsible for the continuous production of cosmic rays, only a minute fraction of which come from the sun. A Washington University scientist was one of the first physicists to show that cosmic rays consist of all of the chemical elements, including very heavy elements such as uranium—as the cosmic radiation should if it were produced in the same explosions which are thought to be responsible for the formation of the elements. University scientists have pioneered in the study of these heavy elements in the cosmic radiation, and they have launched high-altitude balloon flights with detectors which yielded about half of the world's early data on this question. The latter flights used detectors made of plastic and photographic emulsion. Another series of University balloon flights using electronic detectors is providing a much more detailed understanding of the heavy cosmic rays.

The success of the above experiments led to the selection of a Washington University physicist as the principal investigator for a cosmic-ray experiment in the High Energy Astronomy Observatory Satellite to be launched in 1979.

The sun itself suffers violent explosions from time to time, and Washington University physicists have found an unexpectedly large quantity of very low-energy particles in these solar explosions, or flares. This information has led to new speculation about the nature of the solar flare process. The data were secured from an experiment flown to the moon

and returned on the Apollo 16 mission. At still lower energies the sun produces an intense flux of nuclear particles called the solar wind. The first measurements of the abundance of heavy elements in the solar wind are being made on materials flown in an experiment on the Apollo 17 mission. This experiment was constructed at Washington University.

Another object in the solar system which is receiving closer scientific scrutiny is Mars. The outstanding photography from the Mariner mission has shown that Mars, like the moon, has a surface that is greatly cratered. It is evident also that erosion on Mars is very different from erosion on the moon. The Washington University space sciences program includes a professor in earth sciences who is part of the Mariner and Viking photography teams. This faculty member's interest is in understanding the evolution of the Martian surface.

**T**HE IDEAS and techniques generated in the University's space sciences research have had an impact in rather unexpected fields. Perhaps the most interesting of these are the new approaches University space scientists have developed for application in art and archeology. These applications, which have already been used in dating objects of ceramic art, were developed as a combination of the research on extinct isotopes coupled with an attempt to indirectly measure the heat flow from the moon.

The potential avenues of research seem unlimited. When the first lunar samples were tested over five years ago, Professor Clifford Frondel of Harvard expressed some of the excitement in space sciences research. "One glimpse," he said, "answered ages of speculation, and you could see theories falling all around . . . no matter what we did with the moon rocks, the work was new and exciting."

# The Wisdom Of Age

BY DOROTHEA WOLFGRAM

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*Identifying and measuring the wisdom of age is a task facing psychologists in the coming decades. Drs. James and Jean Vanderplas, members of the University's Department of Psychology, are building upon earlier research by colleagues here and elsewhere to study cognitive functions which are maintained or increase with age with the hope of identifying areas of intellectual functioning fruitful for future study.*

AT SUNUP most mornings on a beach near St. Petersburg, Florida, they appear. Singly or in pairs, they walk, some slowly, some not so slowly. In their path is the jetsam of a day's use: beer and pop cans, plastic bottles, cigarette papers, a sandy grape, a sharp steak bone, foot-piercing fragments of a carelessly tossed bottle. In their wake is Indian Rocks Beach as Ponce de Leon may have seen it, littered only by the waters of the Gulf of Mexico. Watching them, one might get the impression that they were beachcombers or beach cleaners, except for their age; they are neither. They are senior citizens, residents of the beach community, out for morning strolls.

Their concern for the environment and their active participation in keeping it neat and clean is one of the topics of research for Drs. James and Jean Vanderplas, members of the Department of Psychology at Washington University. The objective of the research is to identify and describe cognitive functions which may be sustained or increased with age.

"We believe that the idea, prevalent in society today, that old age necessarily results in decline and deterioration of intellectual capacity is incorrect," says James M. Vanderplas, professor of psychology and principal investigator in a study funded by the National Institute of Child Health and Human Development. "Although early research findings were interpreted to confirm the belief in general decline of cognitive functions with age, more recent evidence offers a serious challenge to the idea, and we are accumulating abundant anecdotal evidence to the contrary. Goethe worked until he was past 80; Justice Holmes wrote court decisions at 90; Titian painted some of his finest works in the last decade of his life and died at 99; Churchill continued to write when he was well into his 80's. Each of us knows someone or several persons who at 80 or 90 seem intellectually unimpaired. Yet these are generally thought of as exceptions to some proven rule. We question that the rule has been proven."







The Vanderplases contend that the apparent decline of intellectual functions with age may be due largely to a variety of biases in intelligence tests, test procedures, and research studies. These biases are overt and subtle, group and individual. They point out, for instance, that the high incidence of high-tone hearing loss among the elderly may make it extremely difficult for an older person to respond appropriately to a feminine tester whose voice is likely to be high pitched. On a broader level, they question the validity of the assumption that any standard test today is based upon a fund of experience common to individuals who have lived seventy or eighty years.

"Beginning in the 1920's, standard methods of testing intelligence have made assumptions about aging and intelligence which are myths and which do not have valid statistical data behind them," said Professor Vanderplas.

"Human learning is a marvelous thing," added his wife, Jean, a research associate in the psychology department and coinvestigator on the project. "It is almost impossible to devise a situation in which a human being does not learn—learn and remember for a long period of time. With children, we have discovered that there is often a difference between what we think that we are teaching and what they are learning. It seems possible to extend that idea to the aged: to say that in dealing with a person who has seventy years of experience in living, there may be a great difference between what we think we are testing and what he or she knows. We are trying to find out from old people what they believe they have learned and continue to learn and apply."

"It is assumed in tests that there is some general ability which follows a linear pattern and can be measured in amount, and this ability is labeled as intelligence and its measure as IQ. There is ample evidence to question these assumptions as applied to testing of the elderly," said Professor Vanderplas. He points out that the history of testing is partly a history of test biases for or against certain individuals. With the development of early intelligence tests, designed for children, there arose a belief that intelligence did not increase after about seventeen years of age. Later that effect was recognized as an artificial ceiling imposed by the nature of the test materials and scoring procedures. This led some psychologists, such as L. M. Terman and D. M. Wechsler, to devise tests using new materials, new scoring procedures, and new calculation methods to extend testing to adults. Wechsler, himself, said that the measure of intelligence must be tied to a common fund of experience to which everyone in the society in which the test is designed has been exposed.

Most psychologists recognize that standard tests are not

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necessarily valid for the black population. "But some have been slow to admit this bias because a large body of statistical evidence seemed to confirm the myth of white superiority. But as new test materials have been developed and tested by colleagues such as the University's Dr. Robert L. Williams, we have recognized that part of the fault may lie in assuming that all American children share a common body of experience," said Professor Vanderplas.

The Vanderplas team joins a small number of other psychologists, among whom is Professor Jack Botwinick, also of the psychology department of Washington University, who have been persistent in their suggestion that test materials and procedures applied to the aged be reevaluated. Dr. Sidney L. Pressey, a distinguished scientist formerly of Ohio State University and himself an octogenarian, labels the materials "kid stuff" in his article, "Not All Decline":

Decline in "intelligence"? The tests say so. But look at the tests! It is admitted that the scores on tests of vocabulary and information hold up with increasing age, may improve slightly, but rarely noted is the schoolish content of most such tests, which ask, for instance, the meaning of "ethnology" or the authors of *Treasure Island* and *Faust*. When, instead, tests were made covering information important to adult life, increases in scores from the younger to the older adult years were marked. Generally accepted as evidencing decrements with age are tests involving simple codes, block designs, completion of pictures. But how childish are these tasks! Most derive from the Binet and other tests of a half-century ago, which were in content and appeal planned for children.

Professor Vanderplas further argues that Wechsler's assumption of a common fund of experience is less and less likely to be met as the life span increases. He contends that the concept may perhaps be met in the teenager, who has had experiences through high school, and perhaps through college, which are similar to those of other teenagers. "Beyond school, however, people no longer tend to grow vertically," he said. "They diversify; they become specialists—plumbers, musicians, lawyers, bookkeepers, doctors, auto repairmen, salesmen, housewives—so that the assumption of a common fund of experience is only partly met by tests like the Wechsler Adult Intelligence Scale and is much less likely to be met in the older person."

A second area of test bias which is of concern to those bucking the age/decline assumption is the bias inherent in those tests that compute overall IQ from materials which rely

heavily on sensory/motor performance. They argue that two factors may mitigate against the aged: their inability to have adequate access to the test materials caused by loss of hearing and/or eyesight and their inability to react quickly because of slowing motor responses.

"We would agree," said Professor Vanderplas, "that presbyopia, presbycusis and decline of tactual sensitivity and motor speed are common functions of aging, but we believe that they do not affect real intellectual capacity and growth. However, these have been mistakenly interpreted as losses of intelligence and indications of impairment of other cognitive functions such as thought and judgment."

**T**HE WECHSLER ADULT Intelligence Scale, which is the most widely used test of adult intelligence, computes overall intelligence from performance on both cognitive and non-cognitive subtests and imposes time limitations as well as speed of reaction as a part of the testing and scoring procedure. Researchers have questioned the combinations. They tested the aged without time limitations; results indicating decline and non-decline were mixed. Almost all studies, however, indicated differential decline in different functions. These led Wechsler himself to devise what he called a Mental Deterioration Index. The MDI compares scores of those subtests which "hold" with age to those subtests which "don't hold" with age.

"It seems itself indicative of a bias of thought to term the index 'deterioration,'" said Jean Vanderplas. "By simply reversing the fraction, you could come up with a negative number which is, in effect, a mental improvement index."

The Vanderplas challenges the assumption that Wechsler's "hold" and "don't hold" subscores are reflective of the same mental function. "A number of investigators have shown that overall intelligence may be analyzed into specific factors that have different relations to aging. Some of these, like perceptual and motor speed, may decline with age; others, like vocabulary and information, may improve with age. Professor Botwinick studied test results spanning a period from 1945 to 1963 and Dr. K. W. Schaie, head of The Institute of Aging in California, and his colleagues have been doing these and other studies. But that work overall is just beginning and the studies themselves are based upon materials and procedures which are inappropriate to the elderly," said Professor Vanderplas. "Psychologists, like Irene Hulicka of the University of Buffalo, have shown that speed or time allowances during test procedures can improve performance of elderly subjects when these factors are combined with appropriate materials. We, ourselves, feel strongly that

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*James Vanderplas brings to present research in gerontology a background of twenty-three years of work in general experimental psychology, specifically in fields of systematic psychology, engineering psychology, statistics, and learning and perception. Also an experimental psychologist, Jean Vanderplas has worked within the department for almost a decade in statistics, testing theory, and developmental psychology and personality. She received the Ph.D. degree from the University in 1970.*



the development of appropriate test materials is at least as important as the development of new procedures.

“Professor Botwinick’s work also suggests that a factor which needs to be studied in assessing the cognitive change with age is that of motivation. He has said that available research gives reason to believe that motivational stages change with age, though exactly what these changes are continues a largely unanswered question. He concludes that a major task of the researcher in this area is to find appropriate stimuli for older persons.”

Gerontologists are also concerned with the methods of study of the aged. By their very nature, longitudinal studies of the aged seem to produce biased sampling because attrition tends to result in the dropping out of less able subjects. “Cross-sectional research, however, also has inherent biases,” said Professor Vanderplas, “because samples have tended to be selected from institutions: retirement homes, nursing homes, hospitals. Seldom do you find gerontologists knocking on the doors of expensive condominiums or private homes in good—or even bad—neighborhoods.

“What we have, as a result,” he continued, “is an inherent bias toward selection of healthy individuals in school and adult years and persons less likely to be healthy in the upper years. Also, researchers have not been careful to distinguish age from illness. It is often the sickness, not the age, that leads to cognitive decline.”

**A** STUDY conducted by Robert W. Kleemeier of persons residing in a fraternal home for the aged confirms this view. He concluded that the rate of decline in intelligence test scores reflected adverse health conditions or changes in the organic integrity of the individuals, rather than changes due to age per se. An attempt to replicate these results also suggests that differences in initial ability complicate the picture. Several longitudinal studies of groups with varying initial ability have advanced the proposition that the rate of decline is sharper for subjects of lower initial ability and more gradual for those of higher initial ability.

Cognizant of the emerging body of literature that calls the decline assumption to question and curious about that small body of work which seems to indicate that some cognitive functions may actually improve or even emerge with age, James and Jean Vanderplas have set out to talk to healthy, functioning old people in St. Petersburg and St. Louis.

“We selected the two cities because we felt we should have a varied population. St. Petersburg provides a number of elderly individuals living virtually independent of any family or relatives other than spouses. Most of its older peo-

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ple have moved there from east of the Mississippi and north of the Mason-Dixon line. St. Louis's elderly tend to have lived in the same community much of their lives and to have been in frequent contact with family, friends, and long-term associates. We believe that if these retirement options affect cognitive functioning we will discover that. So far, we've seen no obvious differences," Professor Vanderplas explained.

Using a method known as the critical incident technique, the Vanderplases are doing, as a first step, what they claim few gerontologists do. Although they are not necessarily knocking at doors, they are tapping people on the shoulder on park benches, on beaches, at social gatherings, in markets, and other public places they believe functioning older people are likely to frequent. Interviews are conducted on the spot or set up for later appointments. Many of the subjects continue contact from time to time. The interviewer basically asks the subject to recall any incident in his own life or in the lives of other older persons he knows that would indicate intellectual growth.

"We are only beginning," said James Vanderplas, "but we think we are seeing some trends develop, many of which are only briefly noted in gerontological literature. We think older people are wiser people, better able to judge current events and people in long-term perspective. We encountered an 80-year-old woman who had young neighbors who were very liberal—wild by some standards. We asked if she were not somewhat mistrustful of them. She answered, 'Oh, no. They are just foolish, not dishonest.' Her judgment turned out to be better than ours and closely akin to a trait we have found in many of those we've talked to. They seem to be more tolerant of the young because they seem to have the ability to judge them better, to separate the foolishness from other characteristics."

**A**LTHOUGH words like "wisdom," "experience," "social intelligence," and "judgment" are those more often associated with personality characteristics than with intelligence, the Vanderplases believe that they also may be considered to be a part of adult cognitive function. "What we are saying," said James Vanderplas, "is that we consistently have been finding in older people the ability to organize situations so that they lose their inchoate qualities. That, I think, could be considered cognitive functioning."

"We also believe," he continued, "that we are finding that there are functions which appear in later years which are not, could not be, present in youth. These have to do with the assimilation by older persons of a body of information dealing with concepts which they now are able to organize and

handle in relationship to each other. Older persons seem more capable of observing an event in the present time and making sense out of it in historical perspective.

"We have found that older individuals make good sense of the present economic situation by judging it in relationship to what has gone on in the past. This suggests that older persons continue their developmental function perhaps until death."

**T**HERE HAS been a suggestion in recent years that many persons compensate for declining sensory, perceptual, and motor functions by means of improvement in the use of cognitive functions. The Vanderplases cite the case of an elderly man, who finding that he could no longer lift a bag of leaves from the trash can, cut the bottom from the can, turned the can over with the lid on the bottom and inserted the bag. He now lifts the can from the bag, rather than the bag from the can.

"Some of the generalizations of aging which we find are at least non-universal are the loss of short-term memory, egocentricity, lack of interest in society, and rigidity of moral values," continued James Vanderplas.

"We find older people seem more able to say, 'I don't remember,' and that may be a sign of their arrival at a mature stage of functioning. They are more conscious of the absence of a fact and they are more bothered by its absence than are younger persons. We've frequently had persons tell us later what it was that they didn't remember earlier. I also had an elderly friend ask me to call him at a certain hour on a certain day to remind him of a meeting. When I called, he said, 'You're five minutes late.'"

"Some people whom we have interviewed have also spoken of their regret regarding an earlier moral stand which they took. With later perspective, they say, they feel their stand was too rigid and their action too self-centered. For instance, a retired minister has told us that he has become much less dogmatic with respect to his position on gambling. Thirty years ago, he said, he would have resigned from the church had it initiated gambling at a church bazaar; today, he remained to continue to voice his position and to clarify the moral concept involved, not for his own sake, but for the sake of his parishioners. His action, like that of many of those we hear from and about, indicates a widening of community concern and a concern for the state of values of the society. We believe that this widening concern may not be simply attitude, but may be a genuine part of intellectual growth."

Of course, James Vanderplas adds with a smile, "Old people can also learn to be more effective at nagging, at com-

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*Ample evidence that some older persons continue to lead active, creative lives of the mind has existed throughout history. One of the University's own distinguished professors emeriti is Arthur L. Hughes of physics, who at 91 continues to work in physics and to come to campus weekly to study in the physics library.*



plaining, at getting a rise out of others, at demanding attention. That's growth too. But generally, we find them to be highly concerned with society. Many respond to questions about Watergate, for example, with very considered statements which put the issue in a historical perspective and also evaluate it specifically in terms of moral values in our society.

"There was a recent school bond issue election in which the campaign was based upon the assumption that the elderly would vote against the bond issue for economic reasons. The people whom we talked to gave us a very diverse sample of political opinion with respect to the issue. Those who indicated they would vote against gave us sound reasons. Parents, who were closest to the situation, were voicing the same concerns, but, generally were voting for, in the hope that the funds would solve some of the problems. An elderly friend said, 'I would gladly vote for it if I believed that another 20 cents on my tax dollar would mean that children would get a better education, but I believe the present board and administration is not financially responsible. More funds would only further compound the mismanagement. I am voting to withhold funds to force the real issue to question.' Now which is the wiser action?"

The Vanderplas will continue to gather information, then will analyze their materials to try to identify the kinds of cognitive functioning they believe is sustained or even increases with age. They will formulate hypotheses and experimental designs to test these hypotheses. They hope to implement further studies to test these hypotheses in a continuation of the present work.

"We believe," said Jean Vanderplas, "that it should eventually be possible to design tests of cognitive functioning that a seventy-year-old can pass, but not a sixty-year-old, that an eighty-year-old can pass, but not a seventy-year-old. But first we need to formulate a test which older adults can pass, but younger adults cannot. That will show that we are moving in a right direction."

"We may not design even that test; we probably won't," interrupted her husband. "Ours is basic, broad research to identify areas that might be fruitful for further research. We are aided immensely by the very strong program in gerontological teaching and research going on within the psychology department and at the School of Medicine. We are all deeply indebted to Dr. Marion E. Bunch, now professor emeritus and long chairman of the psychology department. The great interest and strength of this department in the psychology of aging has made it possible to undertake this project and dozens of others going on here."

**U**NDER THE influence of Dr. Bunch and of their colleagues, and as they have listened to the aged, Drs. James and Jean Vanderplas have become not only enthusiastic researchers in aging but also crusaders for respect for the wisdom of age and for the abolition of those stereotypes which they believe humiliate a great majority of the over-sixty-five population and rob our society of a great resource.

Of the over-sixty-five population in the United States, only 2 per cent are bedridden, less than 10 per cent are institutionalized. Relatively few become senile before death. A large number of the elderly remain healthy and active until death. With the numerical increase of the aged population—from 1956 to 1966, the population of the United States increased by 7 per cent while the population of persons sixty-five years old and older increased 35 per cent—the failure to tap this resource becomes an ever-increasing loss.

"The myth of universal age-intelligence decline is certainly partially responsible for the way we treat our elderly and our attitudes toward them," said Professor Vanderplas. "We remove them from active participation in working society. We treat them as some amorphous mass; we institutionalize them. When we realize our error, that realization will have serious social, economic, cultural, political, even moral repercussions."

Perhaps then we will fully realize the wisdom, as well as the wisecrack of one oldster, who told a magazine interviewer years ago, "The best way to retire is to get another job, quick."

*Edwin B. Meissner, Jr., stands in the midst of a display of materials from the St. Louis Car Company collection exhibited last fall in the Rare Book Department of Washington University's Olin Library.*

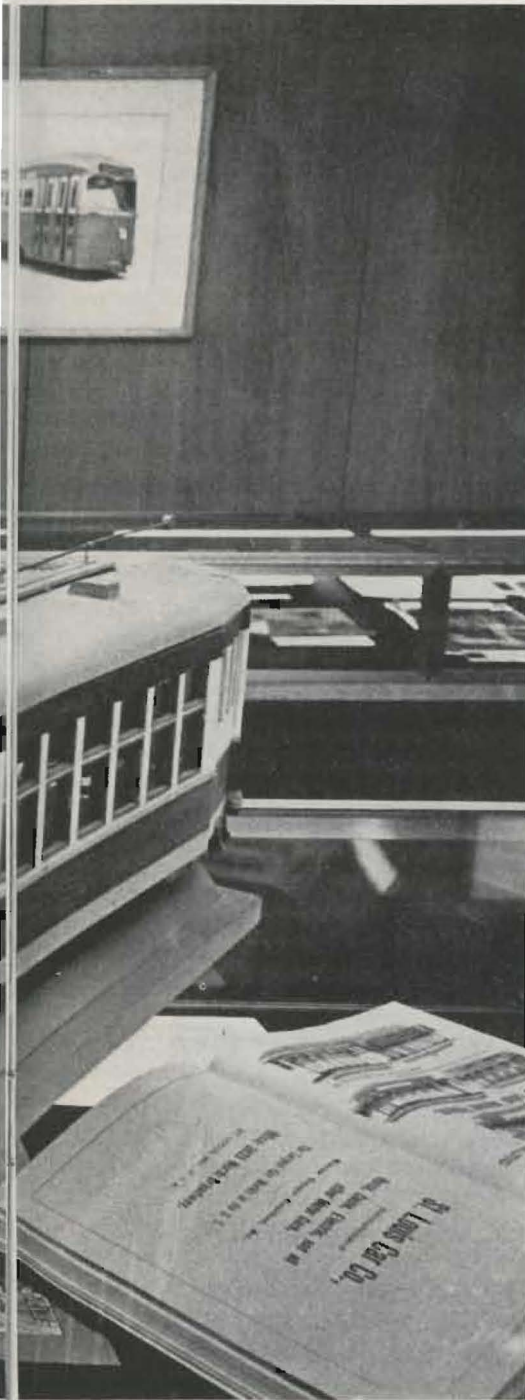
By EUGENE PROVENZO and  
DAVID YOUNG  
Graduate Research Assistants  
Washington University Archives



# St. Louis Car Co.

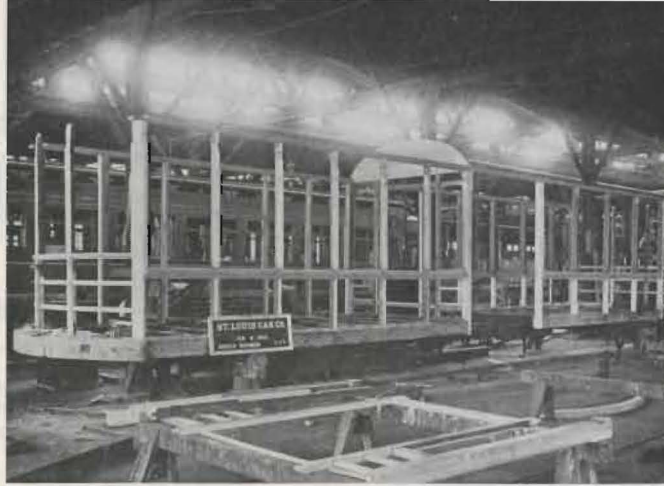
ONE OF THE MOST significant recent acquisitions of the Archives and Research Collection of Washington University's Olin Library has been the gift by Edwin B. Meissner, Jr., former vice president of General Steel Industries, of the working papers, files, and photographs of the St. Louis Car Company of Baden, North St. Louis. Formed in 1887, the company was a leader in the urban transportation field for more than seventy-five years. Although it manufactured every variety of public transportation vehicle, its main emphasis was on the production of streetcars, rapid-transit cars, and mainline rolling stock. During the opening decades of the century, orders coming from worldwide and U.S. markets established "CarCo" among St. Louis's largest industrial enterprises. Within the railway manufacturing industry, the company was acknowledged among both customers and competitors as a "quality shop." The Meissner connection with St. Louis Car began in 1911, when Edwin B. Meissner, Sr., became general manager of the plant. In 1925, the family acquired ownership. St. Louis Car Company became a subsidiary of General Steel

Industries, Inc., in 1960, and ceased business as an entity in 1973. The Company's records are important to both local historians and to those concerned with the general history of transportation in America. The University's collection is the first of its kind preserved in a relatively complete form, and the records provide a significant insight into the character of an important American manufacturing industry. Under the supervision of Archivist Beryl Manne, we as graduate research assistants have worked for months to put the approximately forty cubic feet of materials and 10,000 photographs and negatives into useable form. Independent of the University and of the Archives, we are preparing an historical study of the company to be published late this year, as well as a series of articles. The first, a biography of Thomas Benoist, appeared in the January, 1975, issue of the *Missouri Historical Bulletin*.



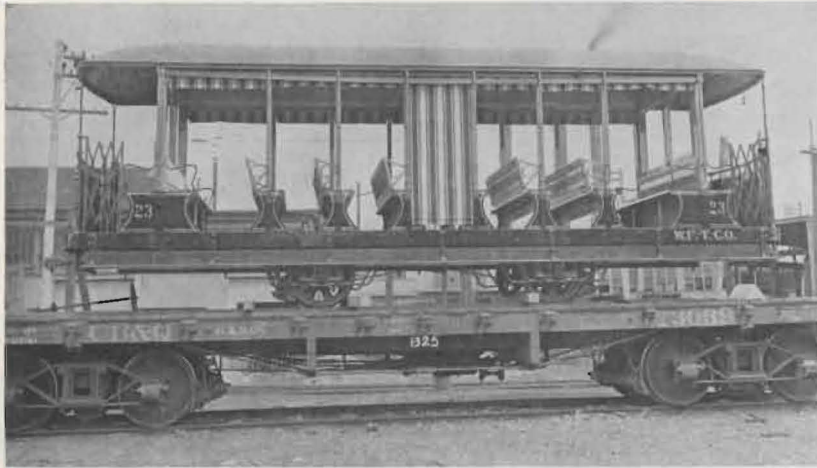
**1912**

Among the last traditional all-wood cars built by St. Louis Car Company were these for the city of San Diego. Steel construction replaced wood between 1910 and 1920.



**1910**

A harbinger of fine weather in many American cities was the reappearance of the open trolley car, stored all winter in the car barn. This car was built for Wichita Falls, North Texas.



**1909**

In the 1890's, the first electric streetcars were short four-wheelers, which in larger cities soon proved inadequate. In small towns like Murphysboro, Ill., however, they remained popular for years.

**1912**

In February, Homestead, and Mifflin Street Railway Co. ordered one open car, evidently to run to a countryside park. Delivered in April, it probably was taken from existing CarCo stock and adapted.



**1929**

Memphis Street Railway received thirty-two city cars very different from predecessors. Designed to take advantage of strength of steel, cars were light weight, single ended, pay as you enter.







*St. Louis*  
*Car Co.*

1941

Two St. Louis streetcars, part of 4000 modern cars built to this design by the company between 1936 and 1952. "Ideal" design resulted from seven-year transit industry study undertaken to boost lagging streetcar business.

1909

Greensboro Electric Railway car is example of fine workmanship of company. Deep satin finish was result of hand painting and rubbing of perhaps 24 coats of paint and five of varnish. Materials were basically wood, canvas (tops), and brass. Interior of antique oak or cherry, ceilings of birdseye maple, door frames of mahogany were finished with ornate brass fittings.



# St. Louis Car Co.



1906

The company created a steam-driven, one-man car to enter the railroad business as Kobusch-Wagenhals Steam Motor Company. Designed for use on branch lines, it was to replace the conventional locomotive and passenger car in general use. Attempt failed and this car was only one ever manufactured.



1914

St. Louis Water Works Railway used cars typical of second-generation city cars. Steel had replaced wood, but design was unchanged and cars were very heavy. The 1929 Memphis cars represent new light-weight design.

1908

Interurbans were a cross between city street railways and main line railroads. City travel was usually on streetcar tracks, but high speed, private tracks traversed countryside.



1965

Design of Bay Area Rapid Transit (BART) car was exhibited by General Steel Industries (St. Louis Car Division), Sundberg-Ferar, and BART. Although essentials of design were adopted for BART subway cars, the company lost contract. By this time, they had built thousands of subway cars for New York, Chicago, Cleveland, Boston, and other cities.



1925

St. Louis Car had sizable orders for buses from St. Louis and other cities during the 1920's. Chassis and engines were purchased and delivered to Baden plant, where bodies were made to order. CarCo was also a major U.S. manufacturer of trolley buses.



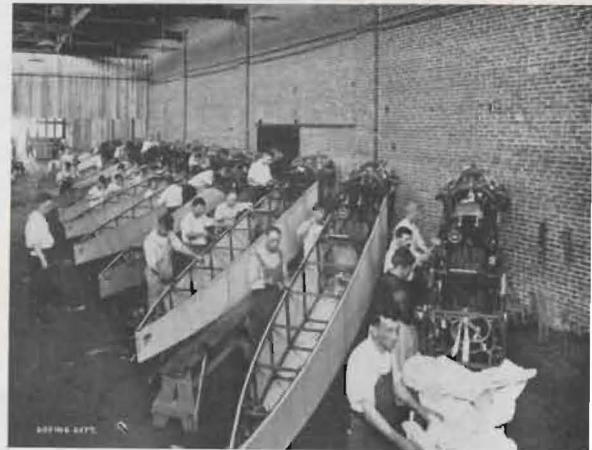
1944

The company was involved in military production during both World Wars and the Korean War. Among work was construction of tracked landing vehicles like this used for invasion of Rendova Island in the Solomons.



1929

St. Louis Aircraft, a wholly owned subsidiary of St. Louis Car, built a beautiful two-seat, private passenger plane known as The Cardinal, remarkable for its advanced design. One Cardinal is known to fly today.



1918

The Doping (lacquering) Department puts together Curtiss Jennies as Army training airplane.

1914

The Type-15 Benoist Airboat, designed by St. Louisan Thomas W. Benoist and built by St. Louis Car, takes a Mississippi test flight. Aluminum twin push propeller engines were far ahead of the day. Designed to make the first trans-Atlantic crossing, plan was foiled by outbreak of war. Benoist attempted to sell plane to British as bomber, but failed. Pictured in front seat are Benoist, Meissner, and pilot Roger Jannes. Other persons are unknown.



# COMPTON SCHOLAR

By ELLEN FARLEY

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*The Arthur Holly Compton Science Fellowship Competition, one of the University's named scholarship programs for undergraduates, attracts outstanding young scholars. One of them, Stephen Lockhart, is a violinist, composer, and track man who has developed a new method for predicting urban expansion and plans to become a neurosurgeon.*

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IN 1905, a twelve-year-old boy sat on the front porch of his family home, gazing night after night at the patterns of constellations and the elusive stars in the sky above Wooster, Ohio. Eventually, the pocket money he earned for household chores amounted to \$3.95, enough for a mail order telescope. Unfortunately, his parents feared he might "develop too narrowly." Reminiscing years later, Arthur Holly Compton wrote, "Mother would not let me stay up late at night to find stars that I wanted to identify." The child outgrew that obstacle, and today a crater on the moon is named Compton. It is just one of the namesakes the late Nobel laureate and former Washington University Chancellor left behind.

Among the others are four scholarships at Washington University, given through the Arthur Holly Compton Science Fellowship Competition for High School Seniors, inaugurated last year. One of the four charter Compton Scholars is Stephen Lockhart, who, having a blithe disregard for small distinctions like the difference between junior and senior, entered the competition as a junior in high school last year and is now a Washington University freshman.

When of the age that Compton began star-gazing, Steve was working out a mathematical method for predicting urban expansion. Stars seem less elusive now than they did seventy years ago, and man has felt the pulse of the moon, but the ebb and flow of human tides is still a problematic subject to students of the city. At the age of thirteen, Steve was curious enough to want to tackle it. Like the young Arthur Compton, Steve, too, occasionally has had to endure the "That's wonderful, whiz kid, but isn't it past your bedtime?" syndrome. Not from his mother, however.

A graduate student in urban affairs at Washington University, Josephine Lockhart is a civic-minded woman who raised her only child in a household liberally spiced with conversation about St. Louis community development. Though her chief business now is finishing her master's thesis, she still

finds time to serve as secretary of the board for the Institute of Black Studies, and offers most of her volunteer efforts to Jeff-Vander-Lou, Inc., a nonprofit, private community organization which assists J-V-L residents in rehabilitating their St. Louis neighborhood. According to William Harrison, director of the Washington University evening urban affairs curriculum and a long-time friend, "Throughout the years you would find Mrs. Lockhart involved in an extraordinary amount of volunteer activities all over the city." Simply through exchanges with his mother's friends and colleagues, Steve grew up developing what he calls "a certain political awareness."

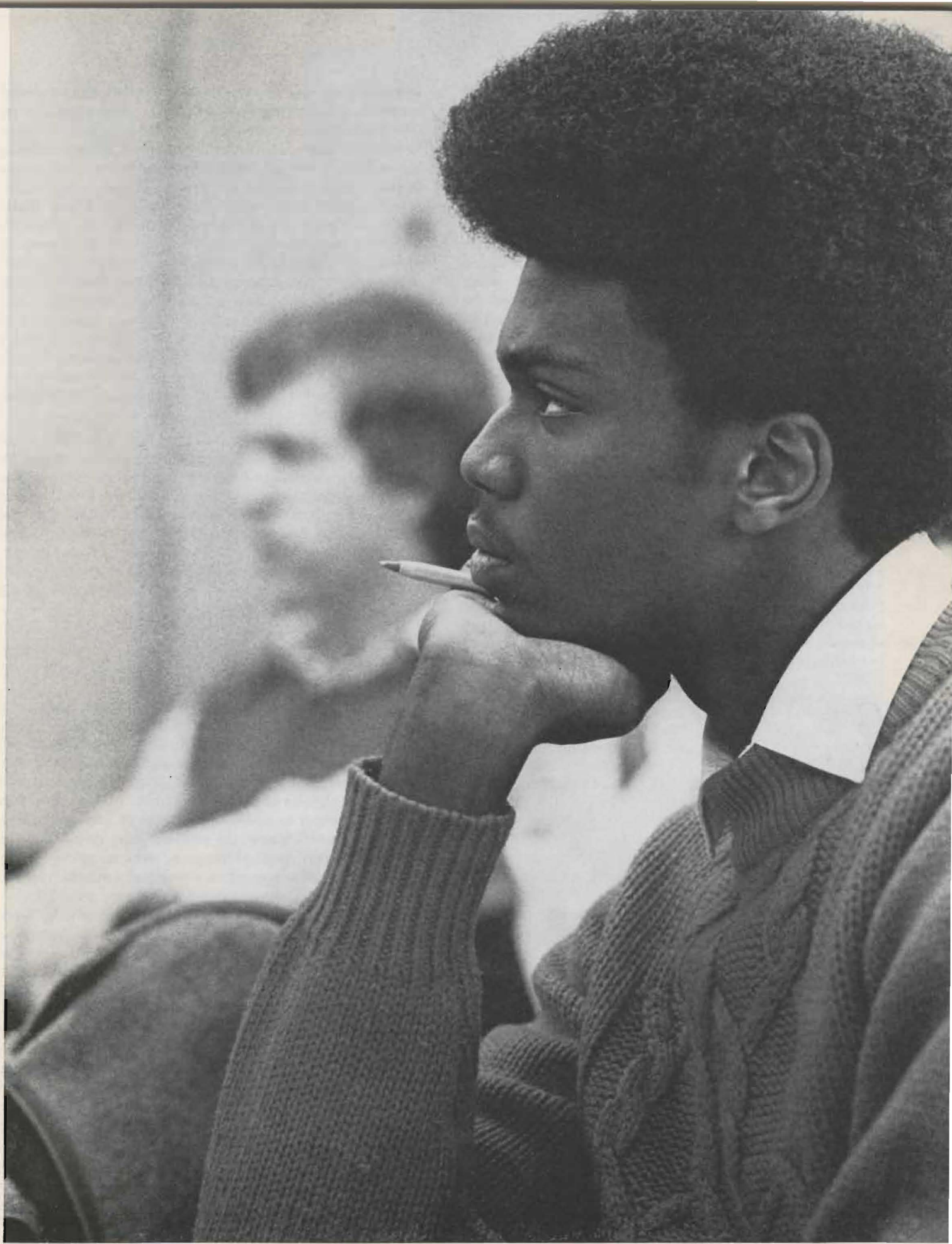
Despite a modest income, Mrs. Lockhart saw to it that her son was always exposed to the most challenging education available, moving him from one private school to another. And so it was that Steve arrived at Baylor University in Waco, Texas, in the summer of '72 as one of a group of gifted eighth and ninth graders attending a six-week symposium on man and the sciences. Wandering off the program track, Steve came upon a group of Baylor geologists working on a corridor studies project. They had noted that the Waco population appeared to be expanding hyperbolically along intersecting highways, which is contrary to the conventional wisdom that population in an urban area expands in concentric circles. To support their hyperbolic expansion hypothesis, the Baylor geologists drew up a series of equations, which Steve borrowed to look over.

The following day he returned to the professors with the news that there were some errors in someone's figures, which he had been polite enough to correct. For the final five weeks of the symposium, Steve teamed up with the geologists following his regular classes to form an urban information exchange that persists today. They gave him real estate figures, aerial photographs of Waco, and population distribution charts, and Steve set about developing their theory.

THE RESULT, "A Mathematical Method for Predicting Urban Expansion," is a viable tool for urban planners, Steve believes. The paper, copyrighted in 1973 and again in 1974 after more developments, is built upon the basic concept that population in an urban environment expands in a series of hyperbolic curves along main traffic arteries, the number of curves depending on the geographic location of the city and its industrial nature. The method predicts socio-economic trends in the city, and can be used to determine the direction of expansion, to predict property values and derive density gradients, to predict the effect new highways will have on property in given areas, and to relieve congestion by utilizing the density gradient.

"When I got back to St. Louis after the summer at Baylor, someone suggested that I contact Professor Leven at Washington University and he really helped me out," Steve recalls. A professor of economics, Charles Leven is director of the Institute for Urban Studies. He introduced Steve to a colleague, James Little, an assistant professor of economics and a member of the urban studies administrative committee, who took up the cause the Baylor professors had begun—providing Steve with data on St. Louis property values which, Steve points out, "there would be no way for me to afford to get on my own."

Since Steve's method was developed independently of his



school program, he worked on it in his spare time, digging out density gradient figures from St. Louis libraries, spending hours and hours amassing information by hand, until his fingers ached. Soon he began writing computer programs to simplify the mass testing of his data.

Preliminary versions of the paper appeared sound enough to win first prize in the *St. Louis Post-Dispatch* Science Fair and to take him to the Massachusetts Institute of Technology as Missouri's representative at the National Junior Sciences, Engineering and Humanities Symposium. Since an article about the method appeared in *Ebony* magazine last spring, he has received several inquiries from agencies around the country for copies of the paper. Authorities in Dade County, Florida, and a regional planning council in Kansas City have promised to send Steve the results of their tests of the theory.

Meanwhile, he has received encouraging signals from the Baylor geologists. "They have a lot of computer printouts on time-travel data and things like that which are important to theories they are trying to develop. They send the information to me if it's relevant, and I give them updated copies of my paper showing the way in which I used the information. They're trying to see how well what I say fits with what they have found to be true. So far, they say it fits pretty well," he said. "A book we read in political science recently said that models should be judged by the accuracy of their predictions and not by the assumptions that are made. That's exactly the way I feel about my theory. I guess I'll work on it a few more years, testing it, using more and more data, and trying to find all the applications that are possible. There will be a point, of course, at which it's no longer useful, but I'm going to try to develop it up to that point."

GIVEN HIS track record, it is unlikely Steve will leave much uncovered. What has most impressed those who have seriously studied the Lockhart method is the breadth of imagination he has coupled with a natural mathematical skill and a rigorously disciplined approach to the research of minute details. In order to understand the method thoroughly, one must have the sort of mind that operates easily in the realm of mathematics and science. William Harrison doesn't have that sort of mind, he says, but when Steve called on him last year for some real estate information, Harrison recognized in Steve's ideas the complete approach to urban planning. The two wound up in a long conversation about political wheeling and dealing behind property assessments, self-fulfilling prophecies for blighted areas, artificial depression of neighborhoods, and the ubiquitous first line of a rapid transit system, which, according to Harrison, is almost always developed to carry city workers back to their homes in the suburbs just as rapidly as possible. The session ended with Steve accepting an invitation to address Harrison's class on strategies for urban change.

At first, Harrison recalls, members of the class eyed their visitor with the skeptical regard of any group of adults about to hear an airtight mathematical theory developed by "a fourteen-year-old egghead." It was after Steve's presentation, when the class began barraging him with questions, that Steve made the point Harrison wanted him to make: you have to be familiar with human, social, political, and economic factors to approach any problem in urban affairs. In

fact, Steve was able to correct a class member who attributed a remark to the wrong local politician. As Harrison puts it, "Steve reads broadly enough to be able to respond efficiently to most questions. He consistently examines historical studies in the light of current events to re-evaluate what he knows to be currently true."

"Well," Steve says, almost apologetically, "I have to. As far as I know my method is totally different. Nothing like it has ever been tried before, and so I'm forced to show the merits of mine as *opposed* to the others. When I've spoken to groups about it, the conversation invariably digresses to subjects that are political in nature. I have to allow for certain things that can happen and so I have to be able to back up my point of view. For instance, the way I see it, there's not a mass exodus out of the city any more. People are coming back in. My prediction takes into account certain trends that I think will develop over a period of years. The method has to be adaptable to account for these social factors."

ALTHOUGH STEVE is confident that ten years from now his predictions will be proven correct, he is a young man in a hurry and does not plan to dawdle at the finish line, waiting to see if his method is the dark horse that outdistances the rest. Ten years from now, he hopes to be studying neurosurgery.

"When you think about the future," he says, thoughtfully, "the thing you really have to worry about is, how long will this field interest me? I think I'll be interested in neurobiology and in practicing surgery for the rest of my life. A few years ago some doctors at the School of Medicine gave me some articles about those fields, and I've been pretty sure of them ever since."

Surveyors of the contemporary student scene could point triumphantly to Steve as the perfect example of today's vocationally oriented young person. He has programmed himself for bachelor's and master's degrees in mathematics and then an M.D. But, unlike many of his peers, he does not find courses in the humanities dispensable. Already fluent in French, he hopes to master German before leaving the University. Richard Dawson, the professor who taught Steve in a first-semester political science course, was initially astonished at Steve's grasp of Greek and Latin history and political thought.

"It's strange," Professor Dawson wondered aloud, "Steve has done by far the best work in my class and yet he doesn't seem to provoke any resentment or hostility as sometimes happens with the brightest students." Though his academic record is redolent of the owl-eyed scholar, his activity schedule is more typical of the free-wheeling student leader.

His new friends at the University would not be surprised to learn that he formed his own rock group in high school, called *Adrastus II*, for which he played the flute. They may not know he is equally at ease in the elegant confines of Powell Symphony Hall, warming up his violin for an evening of Mozart and De Bériot. For the past five years he has been a member of the elite St. Louis Symphony Youth Orchestra, composed of 112 of the best young musicians in the area. This semester, he will juggle symphony rehearsals with those of the Washington University Orchestra, which he has joined.

A member of the Association of Black Students, Steve is

on the communications committee. It is not very glamorous, he advises, making sure all those publicity flyers are pasted around campus, but it is work that needs to be done. His intramural football team, Gangrene, had a record as morbid as its name, but he has higher hopes for the intramural basketball team he plays on. Actually, he says, the only sport he is any good at is track, so he joined the varsity team, but he dabbles in other forms of athletics because "they're just fun."

After class, if he doesn't have a practice or a meeting, he will study in the library, then join friends for a session with music by Led Zeppelin, Mountain, Cream, and Rufus rocking away in the background. "Music isn't a release for me," he said. "It's no more or less important than anything else I do. I mean practicing is not a lot of fun, but once I can see some achievement then I get my enjoyment out of it." For Steve, achievement extends beyond listening or performing.

His first composition, "A Summer Storm," was performed by the orchestra of the Lewis and Clark Summer Institute when Steve was nine years old. He had been playing the violin since he was seven, when an aunt presented him with a half-sized one. Another composition, "Symphony No. 1 in B flat minor," was co-authored by Steve and performed by the orchestra at his high school, St. Louis Priory. "The Priory Orchestra also did a violin concerto in C Major that I wrote just because I think the key of C is never used enough. But most of the stuff I write is just sitting on a shelf," he said.

**W**HEN STEVE comes out of his room at night to try something on his mother, it might just as easily be magic tricks as music. Clowning around with the sleight-of-hand stuff is his latest interest. So far, he does his magic mostly for church gatherings at St. Stephen's Lutheran Church in the city or at parties with intimate friends. A Sunday school teacher, Steve is practicing for the day when he can dazzle his young class with feats of prestidigitation never before seen.

Mrs. Lockhart and son share an apartment in the Central West End of St. Louis. He is, at once, her child and her sidekick. "My mother's friends and mine are sort of the same," he explains. "Whenever she goes to a party that's not entirely an adult thing, then I go along, too." At their informal social gatherings, which often have an age-span ranging from infants to retired folks, Steve has the reputation of a charmer, a well trained young man inquiring after each guest. He is also a card shark. An amused Harrison recalls that at a recent party, Steve kept some of the newcomers unbalanced by figuring probabilities on the card hands that would be dealt, using his pocket calculator.

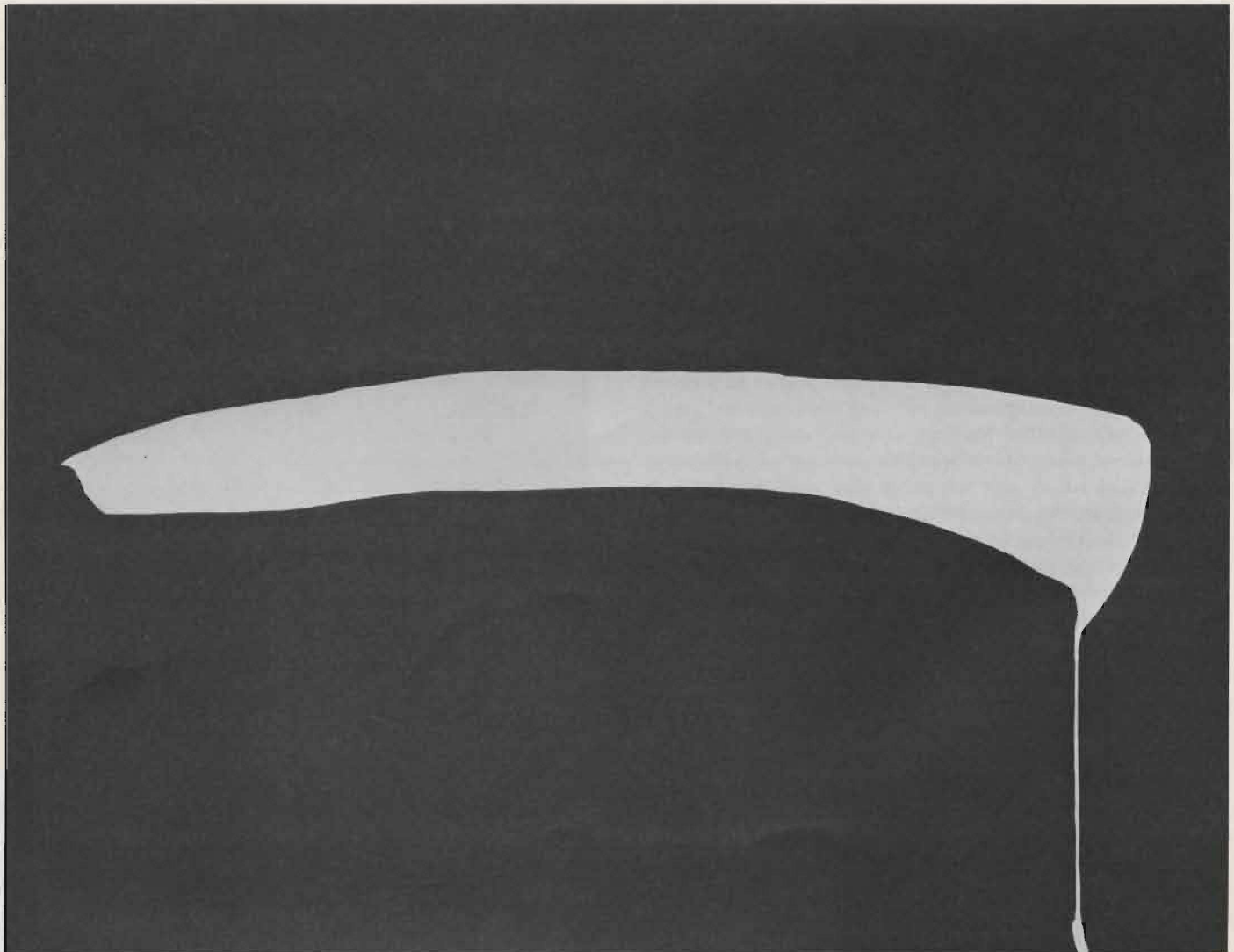
And at least some of the contestants at the Missouri Junior Sciences Symposium will remember Steve as the guy who outlasted and outsmarted everyone at poker the night before the contest, then had the temerity to walk onstage the following evening and accept first prize, looking as bright-eyed and straightlaced as if he had meditated on equations all night.

William Boothby, the professor of mathematics who taught Steve in two classes his first semester, noted, "I've had many students as bright as he is. What singles Steve out for attention in my classes is this very precious quality he has which will make an enormous contribution to University life. He seems always to be at the center of a group of students, a focal point of activity, communicating his own excitement."

It is the self-generation of intellectual "excitement" that impressed the panel of professors who picked Steve and three other freshmen to be Compton Scholars. "We had 500 applicants from all over the country, most of them in the upper one percent of their class," said Aaron Shatzman, the assistant dean of the College of Arts and Sciences who administers the program. "The Compton Scholars are a parallel program to the Arnold J. Lien Scholars in the social sciences, the George E. Mylonas Scholars in the humanities, the Conway Scholars in the fine arts, and the Langsdorf Scholars in engineering. They are spectacular kids who have a leavening effect on campus, because they help raise the level of learning and teaching. They are selected purely on merit, irrespective of financial need, in a nationwide competition. The Compton Scholars receive full tuition, plus a \$500 yearly stipend, so in a way we're paying them to come here. It's worth it."

It is a University tradition that all professors who are advisers have their freshman advisees over for dinner before the registration process begins. Mitchell Taibleson, the mathematics professor who is Steve's adviser, first met Steve in that way. The night was special. With a touch of joy, Taibleson recalls seeing in Stephen Lockhart "that rare student, a complete human being."







Among 1974 gifts to Washington University's fine arts collection is Bernard Rosenthal's 1959 brass sculpture entitled "Moontide." The piece was one of several given by Mr. and Mrs. Joseph Pulitzer, Jr.

Nine lithographs of American Indians by contemporary American artist Leonard Baskin were given by Dr. and Mrs. Harold Joseph of St. Louis. Pictured at left, from left, are Chief Wets It, Spies on His Enemies, and White Horse.



## GIFTS / 74

The University's Steinberg Gallery in January opened a small show entitled "Gifts, '74." Major work of the exhibit is a Picasso oil on canvas, a gift of the late Mrs. Mark C. Steinberg. The remaining twenty-six pieces on display through February represent gifts of thirteen other donors and are remarkable for their diversity, although all are contemporary. In addition to the donors of works pictured, gifts were received from Mrs. Ann Champ; William Quinn, a Fine Arts faculty member; Lawrence H. Greenberg, Ronald K. Greenberg, and Robert C. Greenberg; Shiko Murakata, visiting faculty member last year; Mr. and Mrs. Thomas H. Comegys, and St. Louis University.

The University's outstanding and diverse collection has grown in the past three decades to one of the major university-owned collections in the country. The contemporary aspect of the '74 gifts also reflects the bent of University acquisitions during this period, since no university can afford to buy, nor receives, many old masters. The thrust of acquisitions by gift and purchase has been of high quality contemporary art sold today at a cost which is relatively modest, but of high collecting, as well as teaching value.



"White Line on Black" is title of a 1968 oil on canvas by leading contemporary Japanese artist Jiro Yoshihara. Painting was a gift of the Pulitzers.

# Comment

## A FEBRUARY FESTIVAL

**A**PRIL MAY BE the cruelest month (thanks only partly to the I.R.S.), but February is surely the greatest month. It seems that most great people were born in February, most great institutions were founded in February, and most important and meaningful events (like Groundhog Day) occur in February. It may be the shortest month of the year, but it's a mighty one.

By a most strange coincidence, Washington University was founded in February. In 1853 the State of Missouri granted a charter to establish a private non-sectarian university on February 22, Washington's Birthday. The founding fathers of the institution were so touched by that gesture that they decided to name the place Washington University. (If the charter had come through two weeks earlier, we could be known today as Valentine University.)

February has always been the big month in Washington University history. Every year, a Founders Day celebration is held in February, an impressive and gala event at which honorary degrees are conferred, prominent speakers speak, and everyone takes the opportunity to look back on what has come before us and to look forward to what lies ahead. (This year, Founders Day will be held on

March 1 because the only banquet hall in town big enough for the celebration was booked solid through February, but, anyway, March 1 is practically February.)

Twenty years ago this February, the University staged by far the biggest celebration in its history. That was the Second Century Convocation to honor the University's first century of education and to look ahead to the second hundred years, of which we have now consumed one fifth. It was a tremendous celebration that attracted outstanding figures of the academic, scholarly, and scientific world to the campus. It was more than a birthday celebration; it was a rededication of the University to those lofty goals and noble purposes for which it was founded.

**T**HIS YEAR at Washington University, February is more than living up to its grand old reputation, despite the fact that Founders Day falls in March. The February calendar is crammed with events too numerous even to begin to list in this limited space. To give a few examples:

From February 5 through February 11, the campus community participated in the first major observation anywhere of the one-hundredth birthday of Albert Schweitzer (born in February, of course). It was a city-wide celebration of the great theologian, philosopher, physician, and musician. Herbert Spiegelberg, professor of philosophy, was chairman of the planning committee for the entire cele-

bration. Among the many participants were Norman Cousins, Eric Fromm, and Dr. Schweitzer's daughter, Rena Schweitzer Miller.

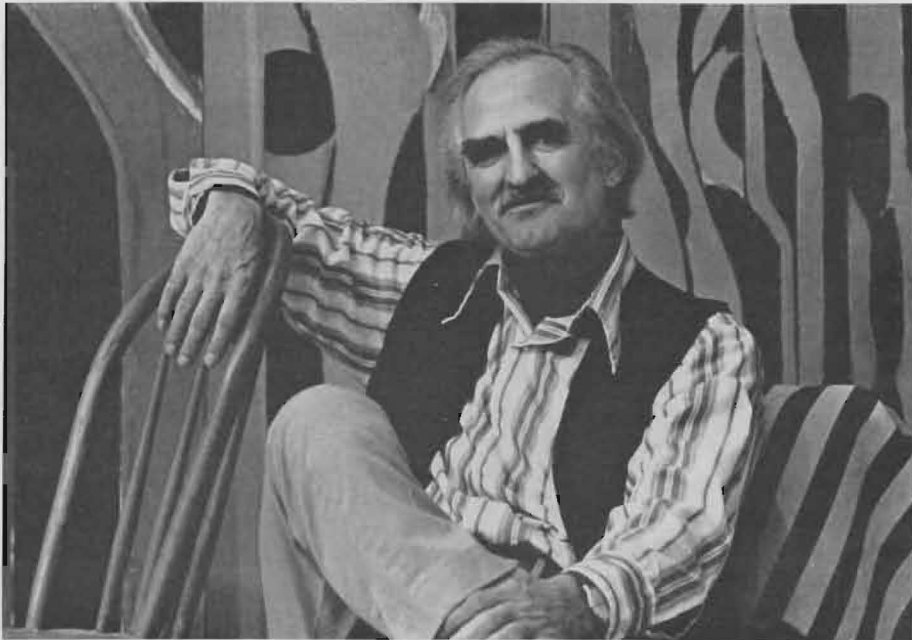
Also in February was the campus celebration of the 101st birthday of Gertrude Stein. The all-day party included lectures, discussions, films, readings, and a slide-lecture on the magnificent Gertrude Stein art collection.

All during February, Steinberg Gallery was displaying its "Gifts-74" collection, reported elsewhere in this magazine. The Edison Theatre had a full and robust offering, beginning with "The Royal Hunt of the Sun," including Bertolt Brecht and Ibsen, and rounding off with the American Mime Theatre. Musical programs planned include a midnight concert of the baroque and two "Musical Offerings" by members of the St. Louis Symphony Orchestra.

Of course, as is usual in February (and truthfully, in most other months), there are enough different activities going on throughout the University to please almost anybody. This month there are swimming meets and wrestling matches and talks on, among other things, "Chromatin Structure and Function in Proliferating Cells," "The Dynamics of Income Velocity," and "Mme. de Staël: Thinking About Women."

**A**LTHOUGH HE WAS born in July, Arthur Osver, professor of fine arts and internationally noted painter, deserves some special mention this month. Osver, whose paintings hang in twenty-five major museums and whose list of honors includes the *Prix de Rome* and the Guggenheim, has been selected for a purchase prize award by the American Academy of Arts and Letters. The award was for one of his studies of the Grand Palais in Paris, a subject that has dominated most of Osver's interest over the past few years.

Osver's Grand Palais studies are among some fifty of his works on display at the Osver Retrospective which opened the new Terry Moore Gallery in Laclede's Landing on the St. Louis riverfront. It seems most appropriate that Osver's studies of the soaring steelwork of the Grand Palais should be on exhibit in the very shadow of that other great monument in steel, Eads Bridge. The Osver works will be on display through most of February. —F.OB.



Arthur Osver, professor of fine arts and Grand Painter of the Grand Palais.



Murray L. Weidenbaum, Mallinckrodt Distinguished University Professor, is director of the new Washington University Center for the Study of American Business, initial operating funds for which have been provided by University Trustee John M. Olin. The Center will have a senior core faculty, and will be interdisciplinary in its teaching, research, and publications.

In its study of the American business system, the Center's basic purpose, Professor Weidenbaum states, will be an examination of the role of the private enterprise system in the development of American society and in the relationship between a market economy and a free society.

"One of the Center's first research goals," he said, "will be to study the need of American industry for new capital and to evaluate the impact of governmental regulations on the business community."

Formerly Assistant Secretary of the Treasury for Economic Policy, Professor Weidenbaum said that the Center will publish its research, strive to strengthen existing courses on the subject of American business, develop new courses, and bring to the campus a series of distinguished speakers from the world of business and finance, government, and academic institutions.

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