Law students hard at work in the Eugene A. and Adlyne Freund Law Library of the new Seeley G. Mudd Law Building. Dedication ceremonies for the building will be held April 22. The Honorable Earl Warren, former Chief Justice of the United States, will deliver the dedicatory address.
SPRING 1972
Vol. 42, No. 3

WASHINGTON UNIVERSITY MAGAZINE

Cover: Commedia dell'arte, popular student mime troupe, poses for Herb Weitman's "fish-eye" lens. For additional photos of this unusual Performing Arts group, see inside back cover.

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Washington University Magazine is published quarterly by Washington University at 1201-05 Bluff Street, Fulton, Missouri 65251. Second-class postage paid at Fulton, Missouri.
WASHINGTON UNIVERSITY:

Continuity and Change

At Founders Day, 1972, Chancellor William H. Danforth gave his first major address to alumni and to the people of the St. Louis community. Here is the text of Chancellor Danforth’s address on “Washington University: Continuity and Change”

In addressing this group, I feel that I am speaking to people who care about Washington University. You, in your varied activities are, in a sense, responsible for Washington University. Washington University sprang from St. Louis. It is a child of St. Louis. It has been sustained and nourished by St. Louis and St. Louisans. When it has been sustained well, it has grown and prospered; when not, it withered and faded. Now, its alumni are spread nationally. The base is broader, but the St. Louis community remains the centerpiece.

This is an especially good time to attempt to sum up, not only because of a recent change in administration but also because of the change of mood on the campus.

Let us first look briefly at our past. Washington University was created in 1853 by a group of energetic and imaginative St. Louisans, headed by a Unitarian minister, William Greenleaf Eliot, and a businessman and state senator, Wayman Crow. William Greenleaf Eliot served in different capacities as both Chancellor and as President of the Board. Once started, Washington University grew and prospered, at least so long as vigorous community leadership made it possible. In the late nineteenth century when leadership talent was lost, Washington University tended to go downhill.

At the end of that century it was revived by a remarkable group of St. Louisans, led by Robert Brookings and including Edward Mallinckrodt, Sr., Adolphus Busch, W. K. Bixby, Samuel Cupples, Robert McKittrick Jones, Charles Nagel, and others. Robert Brookings was the leader. In 1895, at the age of 45, this unusual man made an important decision. He was a gifted and successful businessman. He had already amassed a fortune of between four and five million dollars. At the age of 45, however, he retired to devote himself to education, to Washington University. His dream—a dream that hasn’t stopped—was of a great university in the Midwest. He oversaw the building of a new campus at Lindell and Skinker. He brought together Barnes Hospital and Washington University to form the nucleus of what was to become one of the great medical centers of the world.

The St. Louis community responded with magnificent effort. Money was raised for the buildings. Professorships were endowed. A famous Frenchman of the day, d’Estournelles de Constant, wrote from Brookings’ home, “The Americans... work to enrich themselves but they also obey, like the beaver and the bee, the instinct to protect themselves by helping each other, their city, their country, and the mankind from which their country is inseparable. Each knows that he is only an atom, an instant in the existence of the world, but he knows as well that each atom is a bond between men and nations, between the past and the future, the connecting link in space and time.” Indeed, these men were connecting links in space and time. They built for their city but they built for mankind as well. They built for their time but they built for the future as well.

After the Second World War, Washington University began a progressive transformation under the leadership of academics like Arthur Holly Compton, Carl Tolman, Thomas Eliot, and of community leaders like Harry Brookings Wallace, Judge James Douglas, James S. McDonnell, Charles Allen Thomas and, of course, that marvelous combination of academic and community leader, Ethan...
A. H. Shepley. Washington University is today an important national university.

From the late fifties until the mid-sixties, Washington University grew like a hothouse plant. The federal government and the great foundations provided the nourishment. The driving forces were a combination of the traditional American faith in higher education, an increasingly complex society requiring educated people, and the belief that education best prepared Americans for the national rivalry with the Soviet Union. Leading universities, including Washington University, were called upon to add more and more graduate programs and more and more research, especially in the sciences. From the mid-fifties through the mid-sixties, Washington University's standing was assured. Today, in various rankings, we are not No. 1 nor No. 2, but are certainly in the top twenty, and we plan to be better, better, and better. If I did not feel this way, I should not be speaking to you today as Chancellor.

By the mid-1960's, the forward momentum was great. Confidence was high, but it plummeted rapidly. American campuses, including ours, were torn apart by student unrest, disruptions, and burnings on an unbelievable scale. For many, great dreams became nightmares. During this time the humorist Bill Vaughn was led to write, "If you can't stand violence, get out of the cloister." Universities fell rapidly in public esteem, perhaps in part because they had enjoyed so much confidence, so much trust. As inexplicably and perhaps as unexpectedly as campus violence waxed, it again waned; fortunately so, for many university administrations could then brace themselves for the next set of problems—the financial crisis of higher education about which we hear so much. University presidents now sound less like generals or police officers and more like accountants or economists.

The recent change in mood in Washington University's campus is worth noting. The tenseness and anger of the late 1960's is gone. As a recent graduate wrote, "It is no longer counterrevolutionary to say hello to an administrator." Students have rediscovered the joy of learning and going to college. The faculty have time for their traditional roles of teaching and scholarship. Administrators have time to think and to learn. The student newspaper has been criticizing the administration and faculty for things they can change rather than for things they cannot.

Where do we stand now? Where do we want to go? What do we want to be? All of these are critical questions for us.

First, we are not a clean slate. We have a history and certain structures. For our size we have an unusually large number of degree programs. There is an undergraduate college of about 4000 students. There are professional schools that conduct education in their special fields: architecture, business, dentistry, engineering, fine arts, law, medicine, social work. There is a large, nationally recognized graduate school, in which future teachers and re-

"Washington University is a good corporate citizen.... In 1970-71, we received $26,297,000 in federal grants and $15,897,000 in tuition income, most of which was spent in the St. Louis region."
surgical residents in the School of Engineering and engineers in political science.

What then do we work for in the future? Improvement, always improvement. Most importantly I see a continuing quest for excellence. Excellence must be our reason for being. A medium-sized, high-tuition, private university must be first-rate if it is to expect students to come and the alumni and community to lend support. Excellence means excellent people. Universities are not just buildings. They are much more than organizational structures and the sum of courses taught. Universities are people. The institutions are first-rate, second-rate, or third-rate depending on the people involved. An excellent university is a place at which first-rate scholars congregate to study and to teach; a place where intellectually gifted individuals are supported to think broadly and deeply about the various aspects of our world, from physics to politics, from engineering to music. It is a place where persons of ability not only think and teach but do and teach; a place where scholars study history and chemistry; but also a place where faculty design new computers and paint, where surgeons operate and poets write.

A university, of course, is judged not only by the quality of mind of the faculty but by whether it provides an atmosphere conducive to learning and to maturing. Whatever the faculty does, whatever they are engaged in, teaching is central. An excellent university is a place to which undergraduate students, professional students, and graduate students come to learn from some of the best minds of the day. It is a place that bright young people find exciting for learning; a place to which we would want to send those of our children and our grandchildren who enjoy learning. It is a place of intellectual vigor, imagination, and energy.

Graduate education has a special place in a first-rate university. It is the graduate school that educates the next generation of teachers, scholars, and researchers. It is an extremely important undertaking and one that is expensive to initiate and maintain.

My guess is that in the future the United States will probably afford about thirty to thirty-five first-rate universities. Washington University certainly will be and must be one of these.

Why should there be only thirty to thirty-five universities that are first-rate? If thirty-five are good, would not 200 be better? I would answer, not only would 200 not be better, 200 would not be feasible. The expense would be too great. A first-rate university providing top-notch graduate and undergraduate education is extremely costly to build and to maintain. A special kind of faculty must be brought together and provided with space for research. Expensive tools must be provided. Moreover, a first-rate university must be reasonably comprehensive. We live in a complicated, intertwined society. One individual cannot single-handedly master a discipline, nor can two or three. It is necessary to have a critical mass of scholars to establish the ideal climate for scholarship and graduate work.

In addition, although knowledge is divided into disciplines for convenience and for certain methodological reasons, the cloth of knowledge is finely woven. There are no natural seams. To separate graduate programs in history from graduate programs in political science is to weaken both. To separate chemistry from medicine is foolish.

In addition, is this the kind of institution necessary or desirable for all students? It would be a mistake to have only one model for higher education in the United States. We should have a mix of institutions of differing sizes and approaches. When I talk like this I am sometimes asked, "Is not this kind of talk about excellence really just promotional? Can you actually distinguish between institutions and between scholars, or is it just a matter of opinion? Even if you can tell, is it important?"

These are good questions. Let me start with one perhaps not typical example. Does it matter whether you

"Washington University provides one of the intellectual and cultural foci that makes life attractive in a metropolitan community. Its creative writers, artists, poets, and musicians enrich and stimulate the cultural life of the region."

have a gifted or a mediocre surgeon? Obviously, it matters a great deal. Can one distinguish an excellent surgeon from a mediocre surgeon? Not everyone can, but some can; and those who can are most careful about choosing a surgeon for themselves or for their loved ones. It may be harder for most persons to recognize the difference between a great surgeon and a mediocre surgeon than it is to recognize the difference between a great pitcher and a sandlot player. Nonetheless the difference is as real and to the patient the importance is greater. Now, who should teach the next generation? The gifted surgeon who practices with excellence or the mediocre or sloppy surgeon?
Obviously, there is no question: the man of excellence.

I believe this same analogy holds in other areas encompassed by the University. The outcome of research and scholarship can be great and important or unimportant and meaningless. Here the difference is just as marked as it is in surgery. Research and scholarship can advance human knowledge and understanding. To do so is wonderful. It is one of man's great adventures. People who can do these things well are the advance guard of civilization. But on the other hand, research and scholarship that make no contribution to human knowledge or understanding are wasteful; wasteful to the individual who pursues the research and to the society that supports it. I believe this is a very important point.

A university supports scholars to think and to do research. It should be supporting those who do these things well. Put another way, research is supported for the sake of discovery and for the sake of advancing knowledge. Research is not supported because the mechanical doing of research is inherently good. We honor Columbus because he sailed to the West and discovered land. We should not have honored him had he sailed around in circles just for the joy of sailing, even though we think it proper that sailing be a joyful enterprise. Sir Peter Medawar, the great British biologist, has summed it up this way:

"Politics is the art of the possible; science is the art of the soluble." The point is that if research is not of high quality and does not have a chance of solving something, it is not worth supporting. People in the field must and do make valid judgments.

I believe that one way of expressing what my colleagues and I mean when we talk about a university of excellence or a first-rate university is that we are thinking of a university peopled by faculty who are not only good at expressing themselves but who have something worthwhile to express, men and women who are outstanding guides into the intellectual world. If Washington University is to justify its supporters, its people must be outstanding.

One question that I have had to ask myself is: Do I think society should and do I think it will support a first-rate private university in St. Louis? The answer, of course, is that I hope and think so. Let me ask—Why should St. Louisans and others support Washington University?

Let me give you some of my reasons. First, from the local standpoint, there are reasons of self-interest. Washington University is a plus to those of us who live here. It has educated many of the citizens of our community—businessmen, engineers, housewives, architects, artists, teachers, educators, social workers, dentists, physicians, lawyers. One-half of the physicians and specialists in the St. Louis region. The University provides many kinds of services. Again, close by, within a few blocks, one can get medical care second to none.

Washington University is a good corporate citizen. We bring much business to St. Louis. In 1970-71, we received $26,297,000 in federal grants and $15,897,000 in tuition income, most of which was spent in the St. Louis region. We provide jobs for people in the community. I can provide personal testimony: Washington University even provides a haven for physicians who have drifted from their profession.

Washington University provides one of the intellectual and cultural focal points that makes life attractive in a metropolitan community. Its creative writers, artists, poets, and musicians enrich and stimulate the cultural life of the region. Its buildings often provide convenient sites for musical performances, lectures, and art exhibitions. Its new performing arts center will enhance this kind of contribution to the total life of the community.

Washington University is, of course, an important national educational contributor, but let me give you another set of reasons, more abstract, perhaps more personal. I believe that Washington University is one of this community's contributions to mankind. A successful university is a noble institution. It is a statement of faith; faith that human beings can be educated and that human thought is worthwhile, that the thinking, analyzing animal called man can use his unique talents for the benefit of himself and his fellows; that we can learn from our past; that we can change; that by intelligence we can improve our lot and the lot of our children and their children.

Support of a successful university is an admission that we do not know all of the answers, a concession that we owe much to the past. It is a realization that an evolving civilization raises new questions that need answering, and
a faith that we human beings can come up with answers that move us ever closer to the truth and that knowledge and wisdom can be passed from generation to generation.

A successful university is one of the guardians of a democracy. Our government of checks and balances is based on the assumption that even the best of men and the best of nations are subject to fits of foolishness and even of evil, and the conviction that free men keep their balance by the constant interplay of ideas, and that the free expression of these ideas is the best hope for the self-correction, the self-renewal, that every society needs so much.

In sum, I am convinced that universities are essential for our complicated, urban democracy, as we face problems of social justice, of peace, of population, of pollution, and that society will support these necessary institutions.

I don't think that all this means that I have gone soft-headed, that I have forgotten the recent tension between Washington University and the St. Louis community. I hope not, although I am optimistic enough to believe that much of the tension came from misunderstanding and from failure of communication—really failure to know one another well. The academic world and the rest of the community do not know each other as well as they should. Misunderstanding resulting from faulty communications should not and must not recur. Does it mean I think we can look forward to everlasting harmony? I must tell you that we cannot, anymore than that there is everlasting harmony between parents and children, as essential as both are to this world, or anymore than there is everlasting harmony between the executive and the legislature in our system of government.

Let me give you three reasons why there are town and gown tensions: First, young people do not always agree with their elders. In youth, energy, imagination, and passions run high. Life's juices are at flood and, like a flood, they will jump the confining banks, bringing at times, like a flood, destruction and chaos; but bringing also, like a flood, enrichment and life-sustaining nourishment. Problems between the generations are not new. An oft-quoted statement, attributed to Socrates in the fifth century B.C., might have been made today: "Our youths now love luxury. They have bad manners, contempt for authority, disrespect for older people. They no longer rise when their elders enter the room. They contradict their parents, tyrannize their teachers."

Secondly, it is the function of a community of scholars to conserve the knowledge, wisdom, and understanding of the past on the one hand, and on the other to examine multiple options, to come up with new ideas and suggest new ways of doing things. Thus, many ideas, both from the past and from the most recent studies, will be expressed. Some of their ideas will differ from those popular in the society of the day. It is almost inevitable that sharp differences of opinion will arise. Some of the ideas originating from scholars will be worthless and will be buried under justifiable criticism at no loss to society. Others may form the nucleus of future advances. But note, it may be hard or impossible to tell the difference in the early stages.

A third source of tension is that it is the nature of universities to be universal, to generalize, to look for long-term trends. Most of us involved in day-to-day decisions cannot afford that luxury. We are caught up in our activities. We have to make particular decisions about this individual or that program. Our options are limited. We compromise. Sometimes we compromise to make the best of a bad bargain. It is irritating to have someone tell us that we are shortsighted or even wrong-headed because of some possible remote consequence. I don't like this kind of criticism when I do get it, and I do, any better than anyone else. I believe, however, that these irritations are small prices to pay for the benefits of having intelligent minds take the long view. My belief, of course, is that no one has a corner on truth; that in a free society, sooner or later the good ideas will drive out the bad ideas and the best ideas will triumph over the merely good ideas.

At the moment we have peace and tranquility, good feeling and comfort, within the various elements of the University and, I believe, between the University and the community. I can't promise that it will always be just this way, but what I can promise is an effort to continue to the best of my ability to contribute to the framework necessary for a great university peoples by interesting, exciting people who can add a new dimension to our lives and our community and our nation and, hopefully, a new wisdom and understanding that will cross space and time. My colleagues and I will do our best.
By VICKY SMITH
Office of Publications

NOBEL LAUREATE

One evening last fall, Dr. Earl Sutherland and his wife, Claudia, were on the last lap of a long drive back from a fishing trip in Florida to their home in the suburbs of Nashville. After their brief vacation, both were eager to get back to their jobs at Vanderbilt University: Dr. Sutherland as a medical scientist; his wife as director of the university's office of sponsored research.

When they turned into the driveway of their modest ranch-style home, the Sutherlands found a group of Swedish newsmen camped on the doorstep. The excited Swedes confirmed what the scientific world had long been predicting: Dr. Sutherland had been named recipient of the 1971 Nobel Prize in medicine or physiology.

The quiet evening at home the couple had been looking forward to throughout their drive vanished immediately in a mad whirl of interviews, bursting flashbulbs, television cameras, and congratulatory phone calls and telegrams pouring in from all over the world.

"The mechanism by which various hormones exert their important functions has until recently been a complete enigma," the Karolinska Medical Institute in Stockholm said in announcing the Nobel Prize. Because of the work of Dr. Sutherland we can today understand the general mode of action of many hormones. Indeed, investigators throughout the world have found cyclic AMP to be involved in critical metabolic functions at practically every level of cellular activity. It is similar in this respect to adenosine triphosphate, ATP, a compound found in all cells and which represents the energy reserve in muscle tissue.

Dr. Sutherland is the fortieth American to win the prize in medicine or physiology since it was instituted in 1901. It is the first time in ten years that the prize, this year worth $88,000, has not been shared by concurrent investigators. "One of the most impressive aspects of Dr. Sutherland's contribution is that it is truly unique," said Ira H. Pastan of the National Cancer Institute. "Today, important discoveries are often made simultaneously in different laboratories. In the case of Earl Sutherland, the rest of us were years behind."

Born in 1915, Dr. Sutherland describes his childhood in the Kansas community of Burlingame as being quite ordinary and uneventful. "My father lost everything in the depression, so I worked my way through school," he said; "Then, when I was in my senior year at Washburn College, Washington University gave me a scholarship to medical school. While I was a medical student, and later when I was on the staff, I worked with Dr. Carl Cori who, with his wife Gerty, won the 1947 Nobel Prize in medicine or physiology for their isolation of the enzyme that initiates the conversion of animal starch into sugar.

"I found that I liked Dr. Cori's work and ideas, so I decided to stretch my last two years of medical school into three to devote more time to research. Those early years in the Cori lab gave me the opportunity to work with a number of outstanding investigators. While enzymology was my only productive activity at that time, I was fascinated and puzzled by the actions of hormones.
Washington University Medical School alumnus Earl Sutherland was the 1971 Nobel Prize winner in medicine. Dr. Sutherland's Nobel Prize was the first in eleven years that was not shared by two or more scientists. In winning the 1971 award, Dr. Sutherland joins nine other scientists who did all or part of their Nobel Prize-winning research at Washington University.
The first major advance occurred at Washington University, where I developed a rapid test system and found that certain hormones activate particular enzymes. For example, I could add certain hormones to liver cells and show that within five minutes I'd brought about a chemical change in an enzyme."

Dr. Sutherland moved to Western Reserve University in 1953, and it was there that the second significant development took place. He found the nature of the chemical change in the enzyme and developed a much-needed technique to study hormonal changes in broken cell preparations. The third phase of his research began at this time when he actually isolated cyclic AMP. By an interesting coincidence, Dr. David Lipkin, Washington University professor of chemistry, who was working on purely chemical problems, had a part in helping to identify the precise chemical nature of the potent biological molecule isolated by Dr. Sutherland. Much of Dr. Lipkin's research has been on nucleotides—one of a family of molecules formed by the splitting of nucleic acids (DNA and RNA) by enzymes. The story was told by Dr. Pastan in the publication, *Science*: "Sutherland obtained evidence that it [cyclic AMP] was a nucleotide with unusual properties and sent his results to Leon Heppel, then at the National Institutes of Health. Heppel had previously received a letter from David Lipkin describing a nucleotide he had prepared chemically. . . . One day while clearing his desk, Heppel ran across both letters and realized that both workers were probably studying the same compound. Heppel put the two in communication with each other and the structure of the heat-stable factor was established as cyclic AMP."

"My work since then," Dr. Sutherland continued, "has been the subsequent study of the effects of cyclic AMP on hormones, and writing papers and giving lectures on our findings—trying to establish the biological role of cyclic AMP. A good share of this work has been done since I came to Vanderbilt in 1963."

The new Nobel laureate is a quiet and unassuming man with a dry, unbuttoned humor and a preference for comfortable sports clothes and casual manner. "When I got to the bifocal stage," he says, "I decided to give up the six-and-a-half day work week."

A spirited fisherman, he loves to take off on the spur of the moment for stream or lake, or to the Florida coast, where the Sutherlands have a vacation home. "In fishing," he admits, "my big weakness is that I will go after anything and everything. I've fished Missouri streams from a canoe and I've gone after the big ones off the coast of South America."

He also enjoys puttering in his back garden, perhaps another manifestation of his love of nature and the outdoors. But whatever the job, whether it involves a trout line, a trowel, or a test tube, Dr. Sutherland is adept at getting good results.

His "good results" in the laboratory not only won him a Nobel Prize, but also opened the door for other scientists to study and build a new structure of knowledge about hormones based upon the original discovery of cyclic AMP. Professor Peter Reichard, a member of the Caroline Institute's Nobel committee, said that it was difficult to assess the total implications of Dr. Sutherland's work, but it was believed that he had opened up new paths of research into diabetes and cancer and thrown fresh light on the nature of cholera.

Dr. Sutherland explained this statement by saying, "Research into diabetes can take a new tack now because we know now that cyclic AMP is an important factor in the release of insulin from the pancreas and has something to do with the breakdown of sugars and fats."

In cancer research, he continued, many new investigations using cyclic AMP—by probably 2000 different persons—have begun in the past few years. In laboratory cultures, it has been observed that cyclic AMP inhibits the growth of certain types of cancer cells. This is an extremely broad "test tube" observation. A tremendous amount of fine definition of specific cell processes involved would have to precede any rational clinical tests. It is a very intriguing problem, nonetheless.

"Many scientists hold the theory that cancer is caused by a virus," Dr. Sutherland pointed out, "but, if cyclic AMP controls the activity of the virus, as some think it does, then you can look at the problem two ways. Does cyclic AMP act on the virus in a cancerous cell or does it affect the metabolism of cancer cells without the virus? There will be a lot of work done on that problem. As new cancer centers are set up, I predict that each one will have a corner for cyclic AMP work right next to a big virus center."

"There have been four or five research groups that say that cholera antitoxin stimulates the making of more cyclic AMP. Since cyclic AMP changes the permeability of cell walls in the intestine causing fluids to run out,
the cholera toxin may cause dehydration of the patient. Therefore, if you could control the cyclic AMP, you could more easily control cholera. Many drug companies are working on this problem."

Dr. Sutherland himself oversees at least five major research programs on cyclic AMP right now at Vanderbilt. As Distinguished Professor of Physiology, he divides his time between occasional lectures to medical students and the ongoing research of his postdoctoral students and co-workers.

His most recent work includes research on cyclic GMP (guanosine monophosphate), a very close relative to cyclic AMP and the only other nucleotide that has been found in nature. "We suspect that there may be one more nucleotide, but we don't have good enough methods to show it," he said. "That is always a major hurdle. We spend 30 per cent of our time on methodology."

Another group working with Dr. Sutherland is studying anti-cyclic AMP agents present in tissue. "This could be an important area," Dr. Sutherland points out, "because there are some circumstances in cells that seem to turn off the cyclic AMP system."

Dr. Sutherland, in his own words, is a man who has found in his work a fulfillment of the ideal he dreamed of as a youngster. "I had wanted to go into medical research since my high school days," he says. "My parents gave me books on science and medicine that first stimulated my interest, and the more I read, the more I realized how little men knew about man and why he behaves the way he does."

"My leaning toward chemistry began when I was an undergraduate at Washburn College. And then Carl Cori at Washington University gave me a living example of clear thinking. There have been many influential people along the way, for you have to remember that you never start out in science alone. You start from a huge background of information, and there are always many people who influence or stimulate you."

For some thirty years of his life, Dr. Sutherland has been working in one concentrated area of research because, as he explains, "I think that in the beginning you have to hit a certain path with all the strength you have. Then, it is a question of finding good people to work with you in the laboratory. I've been extremely lucky in that respect. Finally, you get to the point where it is difficult just to keep abreast of all the different aspects of your research."

Now, months after the award was announced, congratulatory messages continue—from Czechoslovakia, from Russia, from China, from everywhere. "I've been asked to write an article for a Russian literary journal and have been invited to China," Dr. Sutherland reveals wonderingly. "I'm constantly being asked for my autograph, of all things, and the Today Show wanted to interview me on my way to Stockholm to receive the prize. I don't have a minute to myself unless I take the phone off the hook and hide. Fortunately I have a fine personal secretary—my wife. All in all, though, the whole experience has been a lot of fun and it has given Claudia and me many new insights."

Plans have already been made for the $88,000 that goes with the Nobel Prize. "Claudia and I have decided that we will give part of the money as gifts to my co-workers and their families and to our children. But the great bulk of the money will be invested in property and, when the time is suitable, we will set up a trust fund and divide what property we have between Vanderbilt and Washington universities."

"We've thought a lot about this," he continued, "and we know that private universities are going to need a great deal of help in the future. Even though our gifts will be peanuts compared to what some people give to universities, the trust will make quite a few scholarships available. If our gifts would make the difference between whether someone gets to go to college or not, it would be well worth it. We plan to share the trust with Washington University because of my gratitude for the assistance Washington University gave me when I was a student there. Washington University is a fine school with a proud history."

The fifty-six-year-old scientist paused again. Then, with a broad smile, he said, "But we must begin looking toward the future." One of his plans is for a hideaway on his Florida property where small groups of scientists from various disciplines could crystallize their ideas in discussions of the impact of medical science on humanity. "There are many people writing about physics and about the nuclear bomb," he explains, "but I would like to use my background in medical science to discuss such topics as birth control, genetic control, government research support, and the delivery of adequate medical care. If anything worthwhile came out of it, we could possibly publish our conclusions."

From a high school student fascinated with microbe hunters to a Nobel laureate, Dr. Sutherland has led an exciting life. The Nobel Prize may be only the beginning.
“Television commercials fascinate me in their depiction of women—there is never one working woman. Instead, we see the swinging, gorgeous teenager who leaps over meadows hand in hand with a gorgeous boy; the choosy housewife—a crow-voiced woman who exists by making moister cake, greaseless chicken, and whiter wash; and the older woman who is constipated. They are never seen as mental giants or interesting dames.”

Marya Mannes

“Man is not the enemy. Men can be our friends in what is really a two-sex movement for human liberation. Men are saying no to the masculine mystique, as women have said no to the feminine. They’re saying, ‘I don’t have to be big-muscled when there are no more bears to kill to prove I’m a man. I can be tender and compassionate and admit that I’m afraid.’”

Betty Friedan
BELIEVING that the basic issues of women's liberation go deeper than burning bras or invading male-only drinking establishments, Washington University's Council for Women's Affairs decided to sponsor a three-day symposium on women's needs, February 9-11. The Council is an eight-member group established last spring to articulate the University's commitment to its women students. Locally and nationally prominent women in the fields of art, literature, theater, journalism, and business were invited. The speakers who came represented a broad cross-section of professions and personalities. They were "interesting dames" in the words of Marya Mannes, author and keynote speaker of the symposium. Helen Spigel, Council member, described the symposium as a "low-key program designed to stimulate an exchange of ideas about the identity of and alternatives for today's woman." The symposium was called simply, "Women: In Our Time."

From Ms. Mannes' opening address on Wednesday to feminist Betty Friedan's closing speech on Friday, women of all ages and occupations—students, faculty, housewives, and businesswomen—gathered on campus to talk about the changing role of women in modern society. The discussions were thoughtful and provocative, running the gamut from the image of women in television commercials to the need for a men's liberation movement. Two former Vassar roommates, Scottie Fitzgerald Smith and Mary Janney, discussed job opportunities for women in both traditional and unconventional fields. Patricia Ball and Thea Marshall, a two-woman St. Louis theater team, gave an overview of "Women: From Shakespeare to Shaw," and Mona Van Duyn, a former Washington University faculty member, read a selection of her poems on love.

The symposium ended on an optimistic note, with Ms. Friedan calling for a "reordering of priorities" and a switch to a "two-sex movement for human liberation."

Janet S. Whatley, assistant professor of romance languages at Washington University, moderated a panel on "Women in the Arts."

Shirley LeFlore, a poet, playwright and singer who performs with the Messenger Singers Group, St. Louis, discussed the problems facing Black women artists. She also directs a day care center in St. Louis.
Gregg Mayer, artist-in-residence, dancer, and choreographer at Washington University, gave her views on women in the performing arts. Miss Mayer organized the first professional British modern dance company.

Mona Van Duyn, former Washington University faculty member and recipient of the 1969-70 Bollingen Prize in Poetry, gave a poetry reading during the symposium. Ms. Van Duyn and her husband edit Perspective magazine.

Miriam Schapiro, who teaches at the California Institute of the Arts, proposed that women art students be taught by women art teachers. Ms. Schapiro's work is exhibited at many museums across the nation.
"If you want to break into the newspaper field, start out at the bottom and keep pushing. Don’t consign yourself to being an assistant, because they’ll (men) always want you to remain an assistant. Journalism is a difficult field for women because it requires much time and personal freedom. The news doesn’t wait—it’s always right now, today. But I believe that journalism is one of the most interesting fields open to women today."

Scottie Fitzgerald Smith

"Life is changing so fast that one out of four occupations that will be in existence in 1980 doesn’t even exist today. You want to be in a position to qualify for new jobs as they come along. And you can’t do that without a basic professional training. You will be faced with limited opportunities in the so-called traditional fields for women, and a tradition of few women in the professions outside these fields where there are real opportunities."

Mary Janney
THE BLACK WOMAN
IN OUR TIME

In her book *Tomorrow's Tomorrow* (Doubleday, 1971), alumna Joyce Ladner takes a hard look at the Black female in today's society. The book, an outgrowth of four years of research on adolescent Black girls living in low-income areas of St. Louis, denies the validity of applying the concept of social deviance to the study of Black America. In her introduction, the author says, “The concept of social deviance is quite frequently applied to the values and behavior of Blacks because they represent a departure from the traditional white middle-class norms, along with criminals, homosexuals, and prostitutes... Their power to cope with and adapt to a set of unhealthy conditions—not as stereotyped sick people but as normal ones—is a factor which few people seem to accept or realize.” Following are excerpts from two chapters of *Tomorrow's Tomorrow*.

When one speaks of childhood in the lower-class Black community, it relates to a different phenomenon than what is typically held to be the standard norm in American society.

The standard conception of the “protected, carefree, and non-responsible” child has never been possible for the majority of Black children. Parents are unable to offer this protection and comfort to their children because of their own vulnerability to the discriminative practices of the larger society. The consequences of the powerlessness of Black parents and their inability to adhere to the standard child-rearing norm necessitated that they devise their own patterns of child socialization. These patterns were primarily predicated upon the principle that children in the Black community must be taught to survive in a hostile society. Various mechanisms were created for dealing with the strategy of survival.

The fact that a parent has to deal openly with this question with his young child probably raises the level of the relationship between parent and child to a more mature one. It also forces an openness and honesty between parent and child on the subject of the external hostile forces that are absolutely necessary. Moreover, the self-defense mechanisms that are an integral part of the child-rearing process act to protect the child against external as well as internal forces. When a parent berates his child for not defending himself on the playground when attacked by his peers, he is likely to use the same defensive tactics in this situation that he would use against white racists who would launch a similar attack. Black children are, therefore, more totally responsible for their own protection than their middle-class counterparts, especially white. The responsibility they are forced to exercise also lends itself to a deeper involvement with shaping their futures, and ultimately to rendering more control over their destinies. Almost by default, these children are forced to become a vital part of the creative process that determines what kind of individuals they are to become. It is the contention of some behavioral scientists that chronological age probably has little to do with one’s maturity when other factors operate in such a forceful way as to be the major determinants of the course an individual’s life is to take.

In traditional analysis, the lot of Black children, being “denied” a comforting and protected childhood, is viewed as a negative experience. It falls within the realm of behavior that produces “social problems” and “disorganization” for its participants and the society. However, if the same phenomenon is viewed within the context of its strengths and positive symbols, we can observe the development of maturity and other creative resources that enhance one’s ability to be an active agent in the society, instead of a passive recipient. This is the role that poor Black children play in this society.

There is a great need for a new perspective and defini-
tion on what childhood means in America and what consequences for particular types of behavior should be viewed as healthy and which ones as pathological. Such a reinterpretation should enable social and behavioral analysts to view the Black child, whose life has often been an unrelenting series of harsh experiences, as a more emotionally stable and well-integrated personality than his white middle-class counterparts, whose protected, sheltered lives are representations of the most fragile personality the society could produce. More simply, a new interpretation of emotional strength and productivity is needed in analyzing socialization patterns and consequences of Black children.

The young Black girl growing up in this environment becomes consciously socialized into the role of womanhood when she is about seven or eight years old. Human socialization is the period when the individual learns specific forms of behavior through interacting with others in her environment in order to facilitate effective functioning within the social group. It assumes different forms and follows different patterns from one culture or society to another. Different patterns of child rearing, for example, can be observed among various social classes and ethnic groups within a society.

In the Black community the primary agents of socialization for the preadolescent girl are her immediate and extended family. Although she spends more time with her nuclear family, it is often members of the extended family, including aunts and uncles, grandparents, cousins and others, who serve this vital function as well. Frequently, girls spend all of their growing-up years in the care of extended kin. Grandmothers act as permanent baby sitters while the actual parents are away working, and when the absence of parents is more permanent. Often children are "given" to their grandparents, who rear them to adulthood. The influence of the extended family upon the socialization of the young Black girl is often very strong. Many children normally grow up in a three-generation household and they absorb the influences of grandmother and grandfather as well as mother and father.

Another important agent of socialization for the young Black girl is the peer group. During preadolescence girls become strong participants in peer group activities. When the child goes to school her reference group expands from being primarily that of the parents and the extended kin to include her peers. Frequently this process of expansion occurs before school age because the child is often exposed to other children in her age category in a meaningful way. It becomes very important for her to judge and be judged by other children her age. The family begins to slowly lose its position of primary importance. It is also during the preadolescent developmental phase that the Black child begins to engage in conflicts with her family. Her self-assertiveness becomes more pronounced because of the decrease in dependency on the family. What was once taken for granted because of its authoritarianism becomes questioned because one's peers might not agree as to its appropriateness.

As they (ages five to twelve) enter into this psycho-social developmental phase, their lives become attuned to how they should begin to relate to each other and to those around them as aspirant women. Although preadolescent Black girls are very much involved in play activities, sibling rivalry, school, and a host of other preoccupations that characterize children in other social, ethnic, and racial groups, there is a strong cultural phenomenon directed toward sharpening roles. It is not very easy to articulate what womanhood means to eight-, nine- and ten-year-old girls. Part of the problem is that they do not yet know how to articulate it, but their behaviors are dramatic representations of it. At the age when girls outside this community are playing with dolls and engaging in all of those activities which reflect childhood, girls within its borders are often unable to experience this complete cycle. The societal canon of "childhood" is often unobserved to varying degrees because it is a luxury which many parents cannot afford. Parents in the Black community are often unable to protect their young children from harsh social forces, which protection would ensure that they grow up in this "safe period" emerging relatively unscarred.

In the community in which this study took place, the adult population often envisioned their community as one which had its share of "troubles"—troubles which hindered them from exercising the necessary parental controls over their children's behavior. There is a noticeable absence of formal and informal regulations in the community which would help to counter the socially unapproved behavior. For example, an eight-year-old girl has a good chance of being exposed to rape and violence, and neither parents nor community leaders have the power to eliminate this antisocial behavior. The community power base still lies outside its borders. In a similar manner, many children are forced to go hungry, without shoes and clothing and an adequate home to live in because of the powerlessness of their parents.

One of the consequences of these pervasive community influences upon the child is that they superimpose emotional precocity on the girl that often exceeds her chronological years. This precocity often enables her to enter networks of individuals and situations wherein traditionally unaccepted behavior for her age group takes place. For example, the thirteen-year-old who can pass for sixteen or seventeen in certain circles not only becomes exposed to but often takes part in behavior that would normally be beyond her range of experience and therefore beyond her capability to manage herself adequately. Among the preadolescents in this study, many of them exhibited behavior patterns and knowledge of "worldly" events that exceeded their years. It was often remark-
Some Personal Reflections on Tomorrow’s Tomorrow

By Joyce A. Ladner

It was almost eight years ago when I first went to Washington University to study toward a doctorate in sociology. It was in 1964 that I also began conducting research among Black females in St. Louis’s Pruitt-Igoe housing project which became the topic of my M.A. thesis and doctoral dissertation. A few years later this project culminated in the book entitled, Tomorrow’s Tomorrow: The Black Woman, which has been excerpted in this issue of the Washington University Magazine.

Many things have changed since then. The Pruitt-Igoe housing project has virtually been closed down because of the inadequate services it provided tenants, and only those families who perhaps had no place else to go now remain. The teenagers who allowed me to “study” them are now young adults, and the pre-adolescents are now in their teens. The majority have probably moved away from the housing project. Some have left St. Louis. I have maintained contact with only a few.

Yet, these eight years are probably insignificant in determining whether there have been any great changes in their lives. When one considers the impact of the increasing Black unemployment rate, deteriorated housing conditions, and inferior educational facilities upon the lives of America’s Black poor, there is no question as to what has been the fate of most of these young women. The overall societal conditions have not improved enough for them to share greater opportunities. Indeed, conditions for many have probably worsened. Most of them are still living in the morass of poverty, racism, and discrimination.

When I first went into Pruitt-Igoe, and as I began to get to know its people, I was struck by the similarity of the problems, the hopes, and aspirations, of all the Black people I had known as I grew up in Mississippi. Most of Pruitt-Igoe’s residents had come from the South and had not yet completely lost the basic orientation toward life that characterizes most Southern Blacks: an unshakable faith in their ability to survive in a society which makes that prospect perpetually dim. Hence, I had a rather strong identification with the teenage girls from the beginning, because I soon realized that it was almost accidental that my working class Mississippi-based family had not migrated to St. Louis, Chicago, Detroit, or wherever. Had they done so, I might very well have spent my growing-up years in a similar environment, with severely limited opportunities for ever breaking out of the restrictive barriers.

As I talked to young girls about their dreams of becoming nurses and doctors, teachers and secretaries, recording artists and mothers, dieticians and wives, I realized that they held the perennial dreams of Black girls—American girls—everywhere, regardless of geographical location, income, and family background. The great difference between them and their white middle class peers was that they would rarely realize the chances for accomplishing these goals.

Hence, it was with much apprehension and anxiety that I faced them over the four years of research. Frequently I played the role of “big sister,” confidant, friend, and adviser. I never fit the model of the “value free,” unattached scientist because my considerations of being a young Black woman myself outweighed any of the established roles of the respectable researcher. I never deluded myself into thinking that I could stand back and dispassionately record, test, and describe my observations. For the social scientist should not have the option of proceeding in this manner exclusively when he is dealing with the social forces of racism, discrimination, and prejudice which have thwarted the psychosocial development of human beings. No “value free” sanctuary was open to me.

Yet, I was also interested in how positive adaptations had been made to the worst possible human conditions. And, in time, I was able carefully to observe certain survival mechanisms that had been passed on from one generation to another, which were responsible for producing so many emotionally sound people and so little social pathology. Daniel Patrick Moynihan and other white social scientists, I learned, had been inaccurate in their descriptions of a so-called matriarchal society, running rampant with “deviant” people.

Since the publication of Tomorrow’s Tomorrow last year, a few critics (mostly white) have attacked the concept of the authenticity of Black culture. A young Black critic even implied that I had “painted the picture of a racist.” I must say, however, that I have had no “second thoughts” and reconsiderations about the major premises I presented in the book. I stand even more strongly today than when I first completed the work behind the idea that Blacks must interpret their own lives and culture from the Black perspective. This was what I attempted to do and I will continue vigorously to promote this approach as increasing numbers of Black scholars build the new “Black Social Science.”
able to observe these children handle stressful situations with a fair amount of capability.

One of the common themes they relate to is violence, to which they are often exposed. When these children are either witnesses or victims of aggressive activity (or potential victims), they react in a manner of intense fright and displeasure as children elsewhere. However, a difference which is of importance with these children is that they have been educated by older children and adults as to the nature and possible consequences of such aggressive activity. This enables them to, in some ways, defend themselves against antisocial behavior more vigorously than would the child who has not had either vicarious or personal experience with these overt acts.

One could say that the mature knowledge they have about antisocial behavior and their abilities to cope with it are symbols of strength that the “protected” child does not share. On the other hand, one of the greatest tragedies is that some parents are often unable to exercise more than minimal control over this rapid developmental process.

Girls growing up in the inner cities in many ways are like their counterparts in other social class, racial, and ethnic groups. They share the same concerns, fears, joys, and questing ventures as other children. Their preoccupation with youthfulness is present although situations and events often occur which force them to think and act more grown-up than they are. They share the concerns with boys, peers, games, and other play activities as do children in other communities. However, there are other concerns that are thrust upon the young girl through environmental circumstances. Often, a purely childhood experience in the impoverished Black community is considered a luxury.

Although the experiences are harsh and oftentimes cruel, children do develop a great amount of strength and adaptability that enables them to adjust to and cope with the world. The strong personality which emerges is to be viewed as positive because it enhances the child’s chances for survival.

From: CHAPTER 3 RACIAL OPPRESSION AND THE BLACK GIRL

“What does it mean to be a poor Black girl in the United States?” is the question I attempted to get all of these youngsters to speak to. Most scholars hold that the development of a positive self-concept is necessary for the child’s adequate functioning in the society. Popular studies have consistently maintained that the formation of the self in the Black child presents a major problem because of the great influence of oppression. The Black “self-hatred” or negative self-image thesis has become so popularized and highly accepted that it is very rarely challenged.

It is inescapable for Blacks who are born into a society that makes such a strong distinction between white and Black (and even between light and dark skin shades within the race) to grow up without, at some point, entertaining feelings of inferiority because they are not members of the majority, privileged group which has attached a high premium to white skin. To some extent, all Blacks must have made the comparisons between the inferior, subjected status they occupy in the society, which are based primarily on color, and the positive value and privileges that are automatically attached to being white.

While it cannot be denied that the system of oppression has taken a heavy toll on the psychological and physical development of the Black child and adult, it can be questioned, however, as to whether or not the impact has been as severe as some scholars maintain. The level of psychological impairment that has been projected in the literature is rarely approximated in real life. There appears to be a negative correlation between these findings about Black identity and the actual existence of the problem.

The current Black consciousness movement and the call for self-reliance are deliberate attempts to overcome the psychic problems which have affected many Blacks.

The most important aspect of the new thrust is that it has provided Blacks with the power to redefine their identities. With the emergence of a new set of standards, they must no longer experience humiliation because they do not meet the white standards. Thus, the new thrust is the most emotionally healthy adaptive and creative response to solving the “self-hatred” problem.

It is interesting to note that psychiatrists and psychologists who are bent on discovering the “psychopathologies” of Blacks do not address the problems of negative identity and self-esteem among whites. Studies have shown that whites suffer some of the same identity crises.

Some of these studies show that measures of self-esteem among Blacks are higher than those of whites, when comparative studies are made. There is sufficient evidence to show that the “alienated” middle-class white youth today are experiencing most profound identity crises, as evidenced by the “tuning out” and involvement in the hippie culture. Feelings of self-hatred are manifest in their rejection of the total value system in which they have been socialized. The self-rejection they are undergoing is certainly one of the most overlooked (perhaps consciously so) areas by psychiatrists and psychologists who seek to discover and analyze psychopathology.

When I went out to conduct this study, I was expecting to find two basic types of responses to my queries about racial identification and the effects of oppression. To some extent, I had anticipated that their responses to being poor Black girls would typify some of the stereotypes about the feelings of inadequacy, worthlessness, and self-disparagement. I also felt that others would have
been influenced by the Black consciousness movement and would articulate "Black pride" sentiments. Still others would, I expected, be proud Black youngsters without having come under the influence of Black pride slogans and ideology. Many of these young ladies possessed an abundance of human resourcefulness and hope for improving their life chances. And the hatred, if present at all, was directed toward those individuals and institutions which inflict pain upon them, instead of being directed inward.

There is a wide range of views on what it means to be poor and Black in the city today. A very small number of girls did not speak favorably to being Black, but none wished to be white. The overwhelming majority of them seemed proud of their race, and accepted it as a factor of life which, although problematic at times, was still real and did not need to be changed. Thus, there was no evidence of low self-esteem and severely damaged psyches among these young ladies. They did not seem to experience feelings of inadequacy, lack of popularity, etc., because of their racial status. As a whole, they were widely accepted by their peers, boyfriends, and other reference groups. In other areas of their lives they saw themselves as desirable love objects, mothers, job holders, valued friends, and individuals with much resourcefulness. There was not a single girl who expressed disdain for her physical features or skin color. In other words, none desired to be white. Perhaps they felt Black and proud long before the slogan came into being.

Implicit in the minds of all these girls is an acceptance of sharing the twin burden of being Black and poor. Few of them spoke directly to racism, and only did so when asked a pointed question. However, all of their feelings about poverty alluded to it as one of the manifestations of being Black. Somehow there was a strong sentiment that things would not be so bad if they were not Black. This was especially evident when they spoke of racial discrimination that involved them and poor white girls when both were applying for employment. Several girls had observed white girls get the jobs that they too had applied for, only to be told that no positions were available.

When one views closely the responses the girls gave on the effects of unemployment, the role of the police, their rationalizations for stealing, etc., it is apparent that they have a clear understanding of what the sources of oppression are. They do not turn their disparagement inward because they have been cut off from the dominant society's resources, but rather, they usually place the burden of blame upon the root causes. Their stark understanding of the "whys" and "hows" of their conditions is phenomenal. Thus, their ability to cope with them and to try to find some means of eradicating these conditions is a decided advantage they had over white middle-class kids whose adaptability to poverty and racism would be more difficult to manage were they suddenly confronted with it. In this context, self-hatred becomes meaningless and invalid because it does not apply. In this regard, one must note that the suicide rate among Blacks, particularly women, is considerably lower than the rate for whites. Neither do Black women experience the same degree of psychological depression as white women.

The question should be raised as to why the "self-hatred" thesis has been consistently advanced when there has been little empirical evidence to validate the thesis. Without a definitive analysis of the psychological condition of the masses of Black people, it would seem unwise for proponents of these theses to continue to advance it. Two of the noted works on the subject, The Mark of Oppression and Black Rage, were based upon clinical studies of a small number of psychiatric patients, many of whom revealed strong neurotic tendencies. Yet these analyses have not only been accepted, but taken as important and unheralded successes on the Black psyche. An important flaw in each of these analyses is that they deal with the pathological character of Black people as a point of departure and not with assessing the burden of such conditions on the society.

It is impossible to investigate the so-called self-hatred without an investigation of the institutional character of racism which produces the manifestations. Thus, one must understand the role the policeman plays, for example, in order to understand why he is disliked and considered an oppressive force. One must understand why education is viewed as the source of salvation to these girls in order to comprehend the essence of their disdain for a system which refuses to grant adequate employment to their fathers and mothers. Finally, one must understand the dynamics of severe physical and psychological deprivation in order to realize the necessity of five- and six-year-olds stealing food and clothing.

It is only when the analysis of the oppressive forces which produce various forms of antisocial behavior has been conducted that we can reverse the conceptualization of pathology. The society, instead of its members, becomes pathological.
SCREENING BLOOD FOR HEPATITIS

Our homely but largest gland, the liver, is remarkably diversified. It helps to purify the blood, stores sugars, prepares fats for oxidation, and aids digestion. Because the liver is so intimately involved with blood, the priests of ancient Babylonia regarded it as the body's most vital organ and endowed it with mystical properties. They used the livers from sacrificed animals to predict the future. Many centuries ago, this form of sooth-saying, called hepatoscopy, was replaced by other methods, largely astrology. In today's technological cultures, horoscopes are the favorite prognosticators; only in remote regions of Borneo do people still consult hepatoscopes.

Recently, things have been looking up for the long-neglected liver. Fortunately, progress regarding the liver has been in fields much more significant than hepatoscopy. We seem to be headed toward long-awaited breakthroughs in clinical research related to a widespread infection of the liver, which is termed broadly, "viral hepatitis" (hepatitis is derived from the Greek word for liver, hepar).

Although there are descriptions of this condition which date back to Hippocrates, it wasn't until the 1940's that viruses were conclusively associated with hepatitis. It also was established that two types of virus were responsible. These two groups of viruses, classified simply as types A and B, are the source of the vast majority of hepatitis. Viral hepatitis, in fact, is second only to measles among the most prevalent reportable virus-caused diseases. It is estimated that there are at least 30,000 serious, reported cases of serum hepatitis a year in the United States and 3000 deaths from the disease. Type A virus causes infectious, or short-incubation hepatitis, and type B is the label for the viral agent behind serum, or long-incubation hepatitis.

Some of the symptoms of both serum and infectious hepatitis are jaundice, nausea, fever, and loss of appetite. But there are major differences between the two forms of viral hepatitis. Infectious hepatitis is usually mild, being most prevalent among school children, and death from the disease is extremely rare. Serum hepatitis can be much more severe in its symptoms. Studies have shown death rates for the disease as high as 10 to 20 per cent.

Patients frequently develop natural immunity to infectious hepatitis; people exposed to it can be made temporarily immune if given gamma globulin injections soon enough after exposure. Infectious hepatitis is transmitted primarily from person to person, and to a lesser degree from contaminated water or food; while there is modest, indirect evidence that serum hepatitis may also be spread from person to person, it is definitely known to be spread through blood transfusions or through the sharing of unsterilized hypodermic syringes—a common practice among people in the growing "drug culture." The main reason for this is that some blood donors are "carriers," that is, they are individuals who have varying quantities of virus B in their blood, but who may not have had overt symptoms before giving blood. For this reason the screening of all carriers has been difficult at blood donor stations, despite the fact that very thorough case histories are taken at volunteer centers such as the Red Cross or the Washington University Medical Center (which includes Barnes, Jewish, and several other hospitals).

Early in 1971, the blood banks at the Washington University Medical Center were the first in the St. Louis area to take advantage of a newly developed test which detects about 25 per cent of all carriers. This test is now routinely done by the Red Cross and most of the medical centers and hospitals in this area (as well as by major voluntary blood centers throughout the country). The fraction of screened carriers may seem small, but it is quite significant when one considers that from 2,500,000 to 3,000,000 people donated blood in the United States last year, and approximately 15,000 were identified as carriers. Moreover, this fraction of carriers includes the vast majority of people who transmit the most serious cases of serum hepatitis.
Viral hepatitis is a serious, worldwide health problem. In the United States, it is estimated that there are at least 30,000 cases each year of the most severe form of this liver disease—serum hepatitis. One known means by which the latter is spread is through blood transfusions. Until recently, there was no laboratory test to detect serum hepatitis in blood donors. Last year, blood banks at hospitals in the Washington University Medical Center were the first in the St. Louis area to use such a laboratory test to screen donors routinely. University investigators are also doing studies to see whether a new testing technique that they have developed is more effective than the screening method now in use. Today's intensified efforts to prevent serum hepatitis were made possible by a geneticist's discovery of a substance, which he detected in an Australian aborigine. This particle, called Australia antigen, later was found to be associated with the virus which causes serum hepatitis.

Dr. Richard Aach, assistant professor of medicine and principal investigator in studies of a new screening device for serum hepatitis. Equipment shown is an automatic gamma counter.
The testing at Washington University was instituted by Dr. Harold Kaplan, director of the blood bank of Barnes Hospital Clinical Laboratories, and Dr. Richard Aach, assistant professor of medicine. They also are cooperating in a project financed by the National Institutes of Health to determine whether another type of screening device—pioneered by Dr. Aach and his co-workers in the division of gastroenterology—will be more effective in screening carriers.

Dr. Aach, principal investigator in the project to develop the new test, pointed out that hepatitis viruses have long been a source of frustration to both clinicians and researchers. Over the past several decades there have been many false starts in trying to isolate or grow in pure form the very small virus-like particles which are suspected of causing the infections. Although a number of virus-like particles have been implicated, no one has been able to grow hepatitis viruses in a laboratory animal or in tissue cultures. To grow pure strains of the virus, of course, would be the critical first-step in developing any vaccine. Now, promising, but very preliminary tests are underway at last long. Last year, encouraging results came from an experimental vaccine used in very limited human trials conducted by Dr. Saul Krugman of New York City. Preparation of a vaccine suitable for mass usage, however, may be several years away. Possibly more important for the immediate future has been the availability of the first screening test for hepatitis.

**This and other exciting clinical work** became a possibility in 1961, when a geneticist, Dr. Baruch Blumberg of Philadelphia, came across an unusual reaction in blood serum he had obtained from an Australian aborigine. Serum is the fluid fraction of blood—distinct from “formed bodies” such as red and white blood cells—which contains many proteins, including albumin and the so-called globulins. Of the latter, gamma globulin proteins are the most important because they include antibodies made by the body to help ward off infections.

To review the “immune response”:

Antibody proteins fix themselves to surface contours of compounds (sometimes proteins themselves) called antigens, which are located on the surface of infectious agents such as bacteria and viruses. That gives the infectious agent a tag in the form of a unique antibody-antigen configuration. This tag is identified by scavenger cells in the blood, called phagocytes, which in turn ingest the virus. If this basic bodily response to infectious agents is initially strong enough, the body will fight off a virus before serious symptoms occur. Once they are produced, antibodies remain in the blood and may protect an individual against further infection from the same virus.

Some people fail to develop sufficient serum proteins because of inherited cellular malfunctions. Dr. Blumberg was in Australia in 1961 doing studies to find possible inherited differences in the serum proteins of various populations. In his screening tests, he found a new reaction to an antibody that was not due to a serum protein. Dr. Blumberg termed the substance behind the reaction “Australia antigen,” not realizing what this substance was and not knowing that it would eventually open new dimensions of medical research. Dr. Blumberg subsequently found that the antigen was common among the aborigines and in various peoples of Southeast Asia; he also found it to be quite rare among North Americans. In 1967, he identified the antigen in a few North Americans who were found to have hepatitis. Because the antigen is so rare in North America, it was a fair guess that it might be an antigen which was part of the hepatitis virus. In 1968, Dr. Alfred Prince of New York City’s Blood Center published a report showing that the antigen was definitely linked to serum hepatitis.

The test now in use to routinely screen blood for Australia antigen has been given the unlikely and unwieldy name counter-immunelectrophoresis. In this test, an electric current is used to trigger antibody-antigen reactions on a small plate with samples of these substances. If Australia antigen is present in the donor’s blood sample, a shadowy line becomes visible to the naked eye—usually within thirty minutes to one hour. As soon as the test was commercially prepared and approved by the National Institutes of Health, Dr. Aach and Dr. Kaplan checked it out for use at the University Medical Center and then actively encouraged its use throughout the area.

Dr. Aach and Dr. Kaplan (who also is an assistant professor of medicine) had already applied for and received federal funds to do a thorough comparative study of the standard test described above with a different type of test which in 1970 Dr. Aach had developed in collaboration with Dr. Charles Parker, head of the Department of Medicine’s immunology division. This test is done through the use of a highly sensitive technique—radioimmunoassay—which has been an important tool in studying a variety of very minute compounds, including various hormones. It was critical, for example, in identifying cyclic AMP, the famous compound isolated by Dr. Earl Sutherland, who is the subject of an article on page 8 of this magazine.

In the radioimmunoassay procedure, blood samples from patients are examined for the presence of Australia antigen. A small amount of antibody is then added to the antigen, which is labeled with radioactive Iodine-125. A device called a gamma counter detects any reaction...
between radioactive antigens and antibodies. Because of the magnification produced by radioactive labeling, extremely minute quantities of Australia antigen can be detected in these samples. So far, this sensitivity has permitted Dr. Aach’s group to detect antigens not revealed in test samples from the standard, considerably less sensitive, screening method. Dr. Aach pointed out, however, that the increased sensitivity of the radioimmunoassay test has yet to be convincingly demonstrated as a more effective method of screening. If a donor is found to have a very low level of antigen, the patient receiving his blood may not develop hepatitis.

To see whether a positive reaction on the radioimmunoassay test actually means something clinically, patients who have received blood—with or without antigen—must be carefully followed to find whether they develop hepatitis. Studies with radioimmunoassay, for example, show that 15 to 20 per cent of healthy adults already have antibodies to serum hepatitis. This suggests that serum hepatitis in these people may have occurred as a very mild, unrecognized illness with complete recovery. It may turn out that such individuals are immune to blood transfusions with very low levels of serum hepatitis virus.

Dr. Aach estimates that no statistically valid conclusions can be drawn for about six months to a year from his experiments. Even if the highly sensitive radioimmunoassay tests prove to be clinically effective, it appears at first thought that the relatively elaborate equipment required for these tests would be too costly for medical and Red Cross centers to use for mass screening. “The cost problem likely can be overcome—if it turns out that radioimmunoassay is advantageous for screening,” Dr. Aach said. “Almost all major medical centers have this equipment in their laboratories already. Also there is rapidly advancing technology in the design of these devices. The key issue is whether we can screen a substantially larger number of carriers in order to prevent transfusion of infected blood.”

The Aach group at Washington University was one of the first four in the country to recognize the potential for radioimmunoassay in hepatitis screening. Now they are one of about twelve laboratories working at a very exciting cutting edge of clinical medicine. “That our University laboratory was able to be one of the first to work in this field is due in good part to the expertise and guidance of Dr. Charles Parker,” Dr. Aach said. He also gave much credit for the University’s progress to his co-worker, Dr. Edwin Hacker, a National Institutes of Health Fellow, who has helped to modify and apply the technique during the past year. “If any laboratory is making real progress, you’ll find that its technicians have made a great difference,” Dr. Aach continued. “If the people in my lab and in the clinical labs at Barnes Hospital had stuck to a 9 to 5 schedule, we wouldn’t have gone very far.”

While significant strides have been made in blood screening problems during the past year, it should be noted that advances in new surgical techniques have been increasing this country’s already high demand for blood. So-called blood component therapy (the use of a specific fraction of the blood such as the red cells or the plasma) has not solved the problem of supply, although it has increased the efficiency of blood utilization; neither has it reduced the risk of transmitting hepatitis.

Because less than 5 per cent of the people who are eligible to donate blood actually give blood, this nation’s excellent voluntary blood banks, such as the Red Cross, are simply unable to meet the rapidly growing need for blood. Commercial blood banks, which pay people for blood, have been in existence for many years to fill the gap. While many of the commercial banks are utilizing the traditional and new screening procedures, Dr. Kaplan noted that commercially obtained blood generally carries a significantly higher risk of transmitting hepatitis virus. Dr. Kaplan also pointed out that the tremendous surge of interest in blood screening—generated by work surrounding Australia antigen—has encouraged all hospitals to rely more exclusively on Red Cross and other voluntary blood banks which have been certified by the American Association of Blood Banks.

To augment present efforts to solve the blood-demand crisis, President Nixon has called for the formation of a federal agency to work toward an increased voluntary blood supply throughout the country. At the same time, bills have been introduced in both the United States Senate and House of Representatives with the aim of instituting more inclusive and tighter federal regulations pertaining to blood banks.

In any case, people of the St. Louis area are fortunate because almost all donated blood used in area hospitals is from volunteer donors, primarily from the Red Cross; all blood in the hospitals associated in the Washington University Medical Center is from volunteer agencies.

The main point, Dr. Aach emphasized, is that every effort be made to provide the maximum possible level of screening for hepatitis. He said, “Blood should always be a gift of life. Medical science is now closer to achieving this goal than ever before.”

Electron microscope photo of Australia antigen particles. It was taken by Dr. Joseph Grisham, professor of anatomy and pathology, who, with Dr. Carl Harford, professor of medicine, is attempting to grow the virus—associated with the antigen—in tissue cultures.
A CONVERSATION
WITH MAX LERNER

Max Lerner earned his master's degree in economics at Washington University in 1925, but he refuses to be typecast. Proud to be called a generalist, he is at 69 a Brandeis professor of American civilization, a syndicated journalist, and an author of some dozen books. A pug-faced pundit, he jets across this country and the oceans stabbing away at his Olivetti several miles up to meet the deadline for his famous column which nowadays deals mostly with politics but over the years has included a potpourri of everything from “sex to sin, psychology, God and gold.”

“I WAS A DROP OUT!” The speaker was not a turned-off member of the now generation, but a pug-faced pundit of almost seventy years with a string of earned degrees and an international reputation as scholar, author, editor, and intellectual gadfly, Max Lerner. He chuckled as he recalled the reasons which prompted him to forsake his studies in mid-year at Yale Law School in the early twenties for the life of a graduate student at Washington University.

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“I happened to read a book called The Theory of the Leisure Class by Thorstein Veblen and I became quite excited. I felt that I wanted to become an economic reformer. Then I saw a sign on a bulletin board which told of a fellowship out in St. Louis which would enable me to get a master’s degree in economics at Washington University and then go on to the Robert Brookings Graduate School of Economics and Government in Washington, D.C., I applied and got it.” So it was that Maxwell Alan Lerner, as he was known in those days, left one of the Brahmin citadels of learning in the East for the banks of the Mississippi and a university which in those days was just a brash upstart compared with dear old Eli.

It all happened almost fifty years ago, and yet Max Lerner recalled it vividly one wintery day a few months ago as he sat in the living room of his comfortable brownstone in the Yorkville section of Manhattan, reminiscing and philosophizing about everything from his college days to the coming election.

Dressed casually in muted, rumpled tweeds that complemented the subdued colors of his parlor, Lerner, with his calm, almost judicious manner, matched the mood of the place, which was one of studied tranquility. Even a life-sized lion, carved of exotic Congo wood, which stood guarding the mantel, looked not at all fierce in this peaceful oasis. Other souvenirs of his global travels gave character to the room. A great Oriental tapestry covered one wall; prints by a good friend, Marc Chagall, hung on another. Nearby was a grand piano, and yet the room, with its lived in quality, did not seem cluttered, but spacious with the old world flavor of a Holbein painting.

Lerner on Lerner is what we had come to talk about, and the conversation hopscotched back and forth across the decades, touching on many of the well-known literati, academicians, and politicians who shaped the thinking of this century. Name-dropping is not an affectation of Lerner’s but something that comes naturally because he happens to have been involved with those who have made or helped to make history.

Trading ideas with the celebrated, however, has left him neither pompous nor stuffy. At the same time, he is no back-slapper, but rather a thoughtful, perceptive man who speaks easily and eloquently in a resonant voice and with what appears to be total recall. His learning, as Orville Prescott, a book reviewer for the New York Times, observed in another context some years ago, is “prodigious”; indeed, almost awesome.

Once, undoubtedly with tongue in cheek, Lerner is reported to have said: “I learned in various colleges and
universities many things which, once I left them, it took me years to unlearn." Maybe so, but what he remembers, either from his student days or from omniverous reading ever since, is phenomenal. Dates, quotations, names—he can bring them all to mind with the alacrity and precision of a computer.

As a student of Lerneriana, mindful of the fact that he is the author of some dozen books including that mind-boggling Leviathan of a work, America As a Civilization, one should be prepared for such mental pyrotechnics, but, nonetheless, his cerebral fireworks are dazzling, particularly when the listener reflects that Lerner celebrated his sixty-ninth birthday just a day before the interview. Conditioned as we are to regard the cutoff age for productivity in this country as 65, it is something of a shock to find that the man who was able to produce a 1036-page, 430,000-word paean on the American national character in 1937 is still sharp, vigorous, and full of plans for the future.

Currently he is winding up a book on Jefferson and is nine months into what he intends for such a sequel to his America As a Civilization epic. Something that he has been thinking about all through the sixties, the latter work will be "about the discontents of our society. I figure that I have another twenty or thirty years ahead of me," Lerner continued, "and perhaps I may even write a novel. Who knows what I will do?"

Who knows, indeed? Lerner refuses to be straight-jacketed into a narrow or rigid Weltanschauung. He views himself as a generalist and makes no apologies for it. He has, as a matter of fact, gone out of his way to justify this position. For his outspoken defense of the much maligned generalist, Lerner has been damned in certain academic circles, despite the fact that he has been a gifted college teacher for most of his life. His credentials as an academic are impeccable (A.B., Yale, 1923; A.M., Washington University, 1925; Ph.D., Robert Brookings Graduate School of Economics and Government, 1927).

But Lerner has not been content simply to toil in the halls of ivy. Since 1949 he has written a column for the New York Post, "freely tackling anything," as a Time reporter noted some years ago: "sex, sin, psychology, God, gold, politics." It is now syndicated around the world by the Los Angeles Times. In 1959 he gathered a few hundred of his columns culled from almost two thousand and put them between hardback covers in a breezy book, The Unfinished Country. Its style is much less formal than America As a Civilization. The copy has a cadence that swings, and now and again Lerner laces his prose with slang to make a point.

In its own way The Unfinished Country is as much a monument to Lerner's erudition and learning as is his storehouse of facts, statistics, and commentary, the Civilization work. But perhaps The Unfinished Country is most valuable because of its preface, which reveals more about Lerner's personality than a Rorschach test. He writes: "If the generalist also finds his metier (at least in part) as a journalist, it is not wholly an accident. The academic environment in America today, except in rare instances, is not one to encourage anything but the specialist. In the academic marketplace the man who has shown interest in a variety of fields is often dismissed as a dilettante."

Later, on the same theme, he observed: "Unfortunately life itself is not divided into these specialized patches, but comes to us whole and asks to be grasped whole. The need of our time is for the man of letters, much as we find him in eighteenth-century England and France, who roamed widely in every field but brought to each the touch of the amateur and humanist."

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In his easy chair at home, Lerner expanded on this thesis—one that is still of major concern to him. Using the measured speech of the scholar accustomed to answering patiently the queries of his students, Lerner sounds and looks every inch the Brandeis University professor of American civilization that he is and has been for almost a quarter of a century, but the thoughts he expresses are still those of an academic maverick.

"In Jefferson's day it was possible to have the sense of encompassing what was known and thought," he explained, "but it is very hard now. For that reason I feel that if any writer, any thinker, has the urge to broaden out and try to do the over-arching, synthesizing work, it is all to the good. I have the taste for that!"

Lerner is careful, however, to explain that in opting for the role of a generalist he is not underestimating the contribution of the specialist. "I value it very much," he said. "Everything that the generalist does is based on what the specialist has done. But there my plea goes back to Mr. Justice Holmes, who said: 'Your business as thinkers is to show the rational connection between your fact and the frame of the universe.'"

The great jurist Holmes has been a major figure in Lerner's life ever since his student days in the nation's capital. He chanced to live next door to the eminent Mr. Justice Holmes and often watched him take his "constitutional" on the arm of various law secretaries, including Thomas G. Corcoran, later one of Franklin Del-
A CONVERSATION WITH MAX LERNER

ano Roosevelt's most pungent and useful New Dealers, and James M. Landis, destined also to become an important figure in the Roosevelt administration. At the Brookings Graduate School, Lerner became very interested in constitutional law and later began to contribute to law journals. Eventually, he conceived the idea of doing a book called The Mind and Faith of Justice Holmes. An anthology with commentary, "It is sort of half Holmes and half myself," according to Lerner.

He also took as his creed that of Mr. Justice Holmes: "It is required of a man that he should share the passion and action of his time, at peril of being judged not to have lived." Lerner later borrowed a phrase from this creed, Actions and Passions, for the title of still another of his books, published in 1949, and he took pains to elaborate on its meaning as expressed in the unfolding of his own life as he talked in New York.

"There is a double aspect to this creed," he said. "One must be a participant in whatever of importance takes place. Today we call it 'social consciousness'; I prefer Holmes' phraseology. But that is not enough. Something else is necessary. One must look very deeply into oneself—into the inner citadel. These two central ideas are not incompatible. One has to do with activism; the other with reflectiveness. My life has tended to move between these poles. The task has been to try and synthesize them."

Nowadays, as he stabs away on his Olivetti in his book-lined study or even on a beach, Lerner seems to be in one of the reflective periods of his life, but during a good part of his career he managed to be where the action was. Indeed, by his own admission, Lerner never shrank from a good fight.

"Remember that line from Tennyson's Ulysses?" he inquired. "'And drunk delight of battle with my peers, Far on the ringing plains of windy Troy.' That's the way I tend to see the whole political process in a democracy. I think it is worth taking delight in battle. I don't have either the sense of bitterness that some of my friends have nor do I have their sense of frantic despair."

Lerner was involved in the New Deal fighting, and in an effort to develop a basic social theory for the early years of President Roosevelt's era, wrote a book whose title, It's Later Than You Think, is credited by a Time writer with having become "a creepy catchword of the time." He supported F.D.R. in his "court-packing scheme," but now admits that he was wrong. "It was still a very good fight, though," he recalled with a grin, "and I learned a great deal from it." Lerner, in fact, indicates that there were few really tough battles over issues in which he was not involved during the thirties and forties, including the sitdown strikes in automobile plants, which he characterized as a "revolutionary development."

This is not to imply, however, that Lerner has a Don Quixote compulsion to redress all the wrongs of the world. He picks the time and place for his donnybrooks carefully. In 1936, when a brouhaha threatened to develop over Harvard President James Bryant Conant's refusal to grant him a leave of absence to edit The Nation, Lerner declined to throw down the gauntlet and persuaded his supporters to turn the other cheek also.

The confrontation came in Lerner's second year as a lecturer in Harvard's department of government, headed at the time by William Yandell Elliott. The youthful Lerner had come to Cambridge in 1935 after having taught previously at Sarah Lawrence College and the Wellesley Summer Institute. Although he had scarcely been around "The Yard" long enough to make much of an impression on many of his colleagues, he had won the friendship and respect of chairman Elliott, who sought the leave for him from Harvard's newly installed leader, Dr. Conant, as Lerner remembers it, in turning down the request, remarked icily: "Any man who could even consider becoming editor of The Nation when he has a chance of continuing on at Harvard doesn't belong at Harvard."

Elliott and another Harvard faculty member, Carl J. Friedrich, "both hinted darkly of resigning," Lerner recalled, but he persuaded them that the matter wasn't worth such a drastic showdown. Then Lerner went quietly off to The Nation, where in harness with fellow editors Freda Kirchwey and Joseph Wood Krutch he proceeded to make a name for himself in the literary world.

Lerner was responsible for the editorial side of the magazine, and the issues of those days reveal that he turned out an incredible number of articles on economic, political, and literary interpretation. After two years on The Nation, he joined the Williams College faculty and about the same time became a contributing editor to The New Republic, a job he held for many years. His mentors there included Bruce Bliven, Malcolm Cowley, and George H. Soule, Jr.

But it was three writers on the New York World in the nineteen twenties, Heywood Broun, William Bolitho, and Walter Lippmann, who made the most lasting literary impression on Lerner. "Broun was a close friend," he explained, "but Bolitho influenced me more. He is one of the most

"The generation gap will never completely disappear because each generation must form its own inner universe of values—the windows through which it looks out to the outer universe—at a different time."
unrecognized writers we’ve had in the history of journalism. Bolitho had this quality of intense curiosity about life, and yet he somehow always retained a certain detachment. As for Lippmann, we were all influenced by him. He showed that it was possible to combine an interest in serious social theory with the working craftsmanship of journalism.”

When asked to evaluate the men who had the greatest impact on his entire life, however, Lerner named two academic economists, Walton Hamilton and Alvin Johnson. Hamilton, head of the Brookings Graduate School while Lerner was a student there, was an unorthodox teacher who was wise enough to throw away the rule book when dealing with non-conformist students. He waived the traditional Ph.D. dissertation when Lerner, trying to write a history of American railroads, hit a roadblock and managed to cover only a single year in 150 pages. In its place, he accepted a half-dozen of Lerner’s equally unusual.

One morning after breakfast, Hamilton casually inquired what Lerner had been thinking and reading about recently. “Novels,” Lerner replied, which wasn’t too surprising, considering that Lerner had concentrated on literature as an undergraduate at Yale. The wily Hamilton invited Lerner to stop by his office, where, through careful questioning, he asked him to develop some relationship between the novel and society, through literary history from Greece through eighteenth- and nineteenth-century England. Meanwhile, other faculty members dropped in, not quite by accident, Lerner decided after a while, and joined in the fun. Four hours later, Lerner was informed that he had passed his doctoral examination, spanning all that Lerner was supposed to have learned at Brookings, he substituted something equally unusual.

This attempt to build a bridge between the two cultures, Lerner believes, is the reason there is less of a generation gap than there was five years ago. But the gap will never completely disappear, he cautions, “because each generation must form its own inner universe of values—the window through which it looks out to the outer universe—at a different time.”

The arduous struggle of young men and women to discover their identity and find their ties with other human beings, Lerner sees as “a way of finding selfhood. It is the reason why my sense of what is happening to the young people of today is very affirmative.”

His sympathy for and rapport with the young does not prevent Lerner, however, from enjoying the company of his own peers. Last fall, for example, long before President Nixon was inspired to ask Andre Malraux to a White House dinner to talk about China, Lerner himself had a chat in Paris with France’s “eternal activist.” The Lerner-Malraux friendship dates back to 1936, when both were working for the cause of the Spanish Loyalists in New York. Their discussion covered a variety of topics, but a single theme, that of greatness in men and nations, kept recurring. Finally, Malraux asked Lerner for his list of peak figures of this century. Lerner named Gandhi, Lenin, Mao Tse-tung, and De Gaulle, and put Franklin D. Roosevelt and Churchill close behind. But he didn’t stop there. Lerner published the lineup in his newspaper column.

This action says a lot about Lerner and also about his determination to rid the press of what he calls “its worst disease, flabby tissue,” caused by “fear of the prickly and the controversial.” Dr. Lerner, never a timid practitioner, quite obviously does not shrink from using “words as razors” to excise what he regards as the fatal weakness of the Fourth Estate. Approaching three score and ten, Lerner still dares to take on all comers.
THE ROLE OF SCIENCE AND TECHNOLOGY

Dr. Glenn Seaborg, 1951 Nobel Prize winner in chemistry and former chairman of the Atomic Energy Commission, was one of the featured speakers in a student symposium held this spring on the subject of "Future Realities." Other prominent speakers during the three-day symposium were John Hughes, editor of the Christian Science Monitor; Nicholas Katzenbach, former Attorney General; John Knowles, president of the Rockefeller Foundation; architect Paulo Soleri, and sociologist Nathan Hare. The following is a condensation of Dr. Seaborg’s talk on the place of science and technology in future realities.

We face some very negative opinions today about science and technology in particular, about man in general, and about their relationships. Broadly speaking, we are told that man is a failure and that science and technology are responsible. This attitude is expressed in many ways by many groups and individuals. There are the bands of disenchanted youths who go off to reject modern society by living in countryside communes where they move closer to nature but still need electricity, still drive to town to pick up supplies with which to live, and still depend on the benefits of that society’s laws, communications, and public health and medical knowledge. There are those groups who, not having gone so far as to reject all of society, reject all of science and technology on the grounds that some of it serves military, social, or political causes with which they do not agree. Yet many of these are the very same groups that clamor for the uplifting of the people of underdeveloped lands, admitting that science and technology must play a role in their advances.

And there are those groups and individuals who are just as unilateral in their critiques of science and technology from other standpoints—some claiming they are leading us toward irreversible ecological destruction, others saying they are the source of an alienation that deprives us of our humanity, and still others seeing them as forces separating us from a biological inheritance that we should retain. Yet all of these will agree, after some reflection, that science and technology have contributed to our humanity, are needed to deal constructively with ecological problems, and could be directed to establish a healthy relationship between man and his environment.

There is a strange mixture of tragedy and truth in all these outlooks—and, unfortunately, a strange distortion of past history and present reality also. The young hippie, for example—the new Thoreau—who goes off with his companions to live a communal life close to nature, no matter how noble his intentions or how strong his feelings, cannot be a model for his fellow man. In his total dedication to his values he can only become a parasite, reflecting a kind of pseudo-independence from the modern world. And should this aspect of his life-style be emulated by all his fellow youth, social and ecological disaster would eventually follow. Contrary to many romantic notions that abound today, nature alone could not support the billions of people on earth now (and the billions due even with population control). Should this be even partially attempted, every hardship that man has suffered in the past would be visited upon him manyfold, nature and man would be devastated in constant conflict with each other, and we would see eventually—rather than the communal spirit and love projected by the young idealists—an aggressiveness and vicious competitiveness the like of which history has never revealed.

There is a basic flaw in the "return
to nature" idea—the idea that anything that man does scientifically or technologically is somehow "unnatural." This is a powerful notion, a pervasive feeling, that runs through the thinking of so many people today as a reaction to some of the problems which science and technology have created. And while there is no doubt that we have an inherent love of the natural and a need to enjoy nature's attributes, that love and that enjoyment are enhanced and highlighted today because we have the luxury of enjoying nature as a friend and not a foe. The people of the United States who can drive to a campsite in a national park and set up housekeeping in a camper or tent trailer with all the conveniences of home can afford to think and feel differently about nature than those people of East Pakistan, for example—some of whom, as seen in the cyclone of 1970, have little choice but to live or die according to nature's whims.

My main point, however, is not based merely on this comparison of perspectives. It is based on the idea that modern man is either acting "unnatural" or separating himself from nature. He is, in the broadest sense, "doing what comes naturally." For if we reflect even for a moment, we can realize how much science and technology are a part of nature's evolutionary process. Nature has endowed all forms of life with some protective or responsive means of survival. But what has she given man in his evolution? He is most poorly equipped in many ways. His sense of smell is inferior to almost every four-legged animal. His natural means of locomotion are relatively clumsy. He benefits from no camouflage, no claws, no large incisors, and in his birthday suit he is ill-equipped to live in most of the world's climates.

What, then, did nature give man? She developed in him a brain and neural system, and a degree of manual dexterity, that allows him to amplify his limited powers through abstract thought, language, and the use of tools and energy. His survival and evolution are based on a dynamic interplay of these, and on his ability to grow by his adjustment to the feedback from his errors and successes.

His evolution today, through the various civilizations and societies we have seen, and into the modern global one that is struggling to be born, is a natural evolutionary process. Furthermore, it is a process that is moving us, not toward self-destruction, but toward a higher form of life.

If man were to pursue the illusion that he could "adjust" to nature without a constant upgrading of his science and technology, he would soon be extinct. Those who would depend for survival strictly on nature's ecological balance, devoid of man's intellectual equalizers, would witness the rapid decline of man and the ascendancy of another species—most likely the insect, perhaps even the lowly cockroach who, we are told, has survived for millions of years and is still going strong.

If we want to shape the future—and particularly through science and technology—we must get out of the traps created by the despair of today's cynics or the frustration generated by unrealistic expectations. Neither condition allows us to develop the proper insight and move on to applying the necessary foresight which is so important today.

How then shall we move ahead? What should we expect from science and technology? What needs to be done to use them to the best advantage? And if this were done where might they take us? In other words, what will be the shape of the future they provide?

To answer these questions we must explore a basic dilemma of our times. That dilemma, stated oversimply, is: How can we have the growth to meet expectations already generated—global expectations that seem to make virtually unlimited demands—in a world of physical limitations, many of which are already being approached? The immediate reaction to this—and it is one shared by many people today—is to stop the growth; or to be more explicit, limit population, reduce expectations, lower production and pollution, and concentrate on the redistribution of material things and the "quality of life." This is a very natural, rational, and human reaction. But, unfortunately, taken as a single prescription, it is neither a very realistic nor imaginative one.

Man since his earliest days has always played what is known as the "zero-sum game." In a limited environment—limits enforced by physical, social, or political boundaries or by his own ignorance—he has had to compete or share a limited amount of resources. But as he grew in his ability to manipulate his environment, through knowledge and tools which gave him advantages, both destructive and productive, he was able to expand the sum to be divided and extend himself to new limitations. Through history—the ages of exploration, of industrialization, of scientific revolution—he was able to expand both his frontiers and expectations. During such growth the impression was gained that he was no longer playing that zero-sum game because different costs—human hardships and environmental changes—were not accounted for. But it should also be noted that each major expansion, each increase of the sum, was made possible by a major human advance in knowledge, in technology and in a new resolution of the human will to support it.

Today we have reached the end of another era of expansion, and in the eyes of many it is an end that is final and discouraging. Surveying population growth, resource depletion, environmental pollution and limitations, and man's general social conditions, these people tend to say, "The jig is up. We have reached the end of the line. There is only one way to go—freeze further growth and work within the limitations of this new zero-sum, this Spaceship Earth which our new perspective allows us to see in a new light."

When contrasted with the major feelings of only a few short years ago that "the sky was the limit," that eco-

"Abundant energy will allow us to save nature—not destroy it—by making a recycle civilization possible."
Economic growth was synonymous with progress and that both were essentially limitless, the new attitude I just mentioned seems far more sane. And I agree that if it were simply an either/or proposition I would immediately side with those who opt for the freeze. For the natural limitations, physical and otherwise, of uncontrolled growth are obvious. And rather than blindly moving ahead into their devastating effects—rather than letting natural laws put a harsh stop to our growth—we would be better off imposing our own limits, harsh as they might seem to some.

But we are not faced with a strictly either/or proposition. Economic growth and ecological balance are not necessarily incompatible. There are areas where new growth and development are essential and there are those in which they should be leveled off or even cut back. There is also a new morality being introduced into the marketplace that will allow economic values to be assigned to environmental necessities so that through a combination of regulations and incentives we can enjoy a type of human advancement neither tied only to a rising GNP nor bound to a harsh zero-growth policy. The key to this middle way, however, lies mainly in the wise development and application of science and technology. Although our global frontiers seem closed, science and technology hold the secrets to widening those frontiers, to radically expanding the new zero-sum to which we seemed to be confined.

The idea of zero-growth is, surprisingly enough, one that appeals most to the educated middle-class American. For a combination of reasons, one of which might be his own feelings of guilt as he surveys his own abundance and environmental impact against the problems of the day, this citizen feels we must change our direction. He is sincere in his concern and willing (but probably only to a point) to make sacrifices to right the wrongs that have been perpetrated in the acquisition of his affluent society. But what he does not realize is that, for all its size and impact, if it
were possible to distribute today's wealth evenly among the four billion people of the world, it would not go very far in meeting the needs and expectations that exist—not to include those of the future already born.

And simply to compare the income and environmental effects of the average American and a citizen of a developing nation and use that as a guide to future action makes little sense either. To the hungry and the poverty-stricken, ecology is irrelevant. Not having Social Security, or much other security, they breed for survival—to assure the perpetuation of their people and to have the necessary support should they survive to old age. So that while important programs of population control have been moderately successful they struggle against a natural instinct that could be adjusted by greater development—development that can take place through advances of science and technology without further environmental degradation and within some kind of rational economic framework.

The reason why our science and technology have, paradoxically, been both a success and a failure—why they have created the progress, expectations, and problems they have—is that they and their applications have been developed and adopted in piecemeal fashion within a market economy. Until most recently in our scientific age, we did not have the benefit of ecological or systems thinking—nor with expanding physical frontiers did we have the need or desire for them. Specialization seemed to gain the most productive results. Everything invented or developed was used to the limits of its profitability with its negative impact absorbed or written off, if noticed at all. And so we moved into what Simon Ramo has called the "Century of Mismatch," with unplanned or ill-planned growth, institutions incapable of understanding or directing that growth, and leading to our current era when new limits, new interfaces, and all sorts of discontinuities have suddenly seemed to hit us just as we thought we had the "good life" really made. Today we have a great awareness of this situation, and from this awareness a new set of truths is emerging and new guidelines for the course of society are being written.

One of these truths is that future development cannot come about through the direct exploitation of nature or man. It must be the result of using the capital of growing knowledge, of rethinking our values and revising our priorities, of learning to do more with less by increasing efficiency, by the maximum recycling of resources, by being more imaginative and less restricted by tradition in design, by learning to manage the greater complexity that is involved in the systems thinking and action we must employ.

The need for the systems approach—the ecological approach—is an important truth in itself. If we look around us we see that almost all the problems of our age are problems at new interfaces or that take place because of a lack of integration between related forces both mechanical and human. For example, we no longer have merely a highway system, a railway system, and an airways system—we have a total transportation system in which each of these components must flow together. If one ceases to function or becomes overloaded, the backup immediately affects or even cripples the others. If we look one step beyond this we can see that if our energy system, or any portion of it, fails, our transportation system is imperiled, our communications are affected, our health is endangered by the failure of other services and so on in a chain reaction. Similar critical relationships exist between the chain of resources, production, and waste—and at the man-and-machine interface—as the role of man continues to shift from production to services. In other words, modern civilization has an ecology of its own, and maintaining its balances as well as the smooth functioning of its parts is now essential.

The human aspects of this ecology provide other examples of why discontinuities and mismatches must be adjusted. In a world witnessing an explosion of people and human activity at the same time that an implosion of these, through urbanization and other forced contacts, is taking place, enormous potential for conflict is generated at all points where there are disparities. These disparities may be harsh physical and economic differences, they may be differences in education and opportunity, they may also be psychological and cultural differences. And today on both a global and a national scale we are seeing violent reactions to these differences in the form of rising nationalism, intensified racial strife, and increased conflict over ideological differences. The resulting turmoil caused by these polarizations cannot be wished or talked away. It cannot be ameliorated by retreat to irrationality or mysticism. It cannot be reduced by rationalizing that science and technology are responsible for it and therefore should not be allowed to interfere further, or, the opposite, that they alone should be responsible for correcting a situation they produced.

The solutions I see in resolving all these related problems of our age lie in recognizing fully both the organic nature of human civilization today and its inherent relationship with the natural environment that supports it. They lie in recognizing that science and technology, the major forces behind the growth and intensification of these relationships, must be used...
to gain the knowledge we need to fill the important gaps in our physical and social intelligence and to adjust our discontinuities and coordinate our mismatched relationships. They lie in building the social institutions (and perhaps restructuring some of our existing ones) to direct science and technology wisely just as those institutions must extract intelligence and a certain wisdom from science and technology.

Actually, we are struggling with these solutions today—or beginning to. They seem so complex, so overwhelming at times that we wonder if we are not losing that “race between education and catastrophe.” But I think we have at hand and are developing certain tools to help us win it. Some of these have arrived on the scene, historically speaking, virtually in the nick of time. I have often spoken of nuclear energy in this context because I believe that if we pursue its development carefully and apply it wisely it will provide a reasonably controlled population of reasonable demands with a virtually inexhaustible supply of power and at a time when we can anticipate the depletion of other sources of power. I emphasized the reasonable population size and its reasonable demands because there are those who upon hearing of inexhaustible energy blanche at the idea that it will only be used to support catastrophic growth. But if after all that we are learning these days we still believe that any technology will be used to its ridiculous extremes, or to support other obviously dangerous excesses, simply because it is there, or is temporarily profitable, then we face the greatest danger of all: literally that of lacking the collective intelligence or will to adapt to our own evolution. I refuse to believe that we are suicidal. I do not think we will go that route.

Nuclear energy used wisely will free man for eons from what Kenneth Boulding calls “the Entropy Trap.” Abundant energy will allow us to save nature—not destroy it—by making a recycle civilization possible. In such a civilization only energy will be depleted and natural resources, as we advance further in our knowledge of chemistry and physics, will become the building blocks of a world in which there can be endless variety without destruction. In such a civilization, we can expand the “zero-sum” so that all men can enjoy freedom from want, learn the true meaning of security, and live in dignity with their fellow man. Here are the real challenges to today’s anti-technologist, environmentalist, humanist, and all the rest—to help us build a world that can retain its natural beauty and be an endless source of human creativity.

Another technology that I believe is coming to the rescue of mankind—that may make mankind possible—is the computer. As the British cybernetics expert, Professor Stafford Beer, has pointed out, “Society has become a complex organism, and it needs a nervous system.” We are now a global civilization that depends for its survival on a growing influx of data which must be processed into information, stored, distributed, and even-"To the hungry and the poverty-stricken, ecology is irrelevant. Not having social security, or much other security, they breed for survival. . . ."tually upgraded to knowledge and wisdom. Today the computer is the vital link in that system. And in addition to telling us where we are, it can help us to shape our future by giving us the means to project and examine alternate futures. Through the computer models we can “look ahead” to the consequences of various courses of action we may choose. And thus we may choose more wisely.

There is no way, in my opinion, to achieve the quality of life held forth as the aims of most people today without a realistic recognition of the potential of these forces. There is no way to reduce poverty without greater productivity and economic growth. And these are tied to advances in science and technology. There is no way to reduce pollution and solve our environmental crisis without greater operating efficiency and the recycle of resources. And these are tied to advances in science and technology. There is no way to reduce the growth of population without a combination of better methods of birth control, better education, and a better standard of living for all. And these are tied to advances in science and technology. And there is no way to lasting peace in the world without the implementation of those items I have just mentioned plus a realistic program of arms control and disarmament.

And even this, as we know from our experience in the field of nuclear safeguards, is tied to advances in science and technology.

The problems we face today, and the expectations we must meet, call for a tremendous increase in knowledge and in the wisdom with which such knowledge must be applied. In contrast to increased specializations, this task will also require a far greater effort along interdisciplinary lines. For our problems, aside from revealing gaps in specific data, have also revealed the need for greater understanding of interactions and synergistic effects. If there is anything that has been made clear to us in recent years—in all our confrontations with environmental, economic and social problems—it is the organic structure and functioning of both our human society and the natural system which sustains it. The key to our future, therefore, lies in our willingness to accept, understand, and master an ever-increasing degree of complexity. It is this route, not simply self-denial, humility, or a “return to nature,” that will allow us to lead a life in which we can live in harmony with our natural environment, control destructive growth, and yet continue our creative evolution.

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EARLY IN February, pale pink and white posters began to blossom out on campus bulletin boards announcing the first annual Red Rose Cotillion. "First annual red rose what?" was the average reaction on campus, especially when a careful reading of the fine print revealed that the occasion was "formal"—meaning long dresses and suitcoats were required—and that admission was twenty-five cents per person.

Despite the steep admission price, a crowd of more than four hundred showed up at Mary Brooks Holmes Lounge on the night advertised—and they showed up in "formal" attire, ranging from bonafide white tie and tails to hoopskirts straight from grandma's attic and de-mothballed World War II uniforms. On the night of the ball, couples waltzed to the lilting strings or cha-chaed to the Latin tempos of the Wally Masters orchestra in a Holmes lounge decorated for the evening with tissue paper red roses and festoons of paper draperies. A hush fell over the audience as a whistle announced commencement of the entertainment—demonstrations of ballroom dancing of the Arthur Murray era. Long skirts swirled and high heels tapped to the anachronistic rhythms of the violin-accordion-bass-saxophone combo. During the orchestra's intermissions, many guests put aside their put-on decorum to respond to contemporary recorded music in contemporary fashion.

THE GRACIOUS, spacious chamber that is now the Mary Brooks Holmes Lounge was the reading room of Ridgley Library for more than sixty years. The room was opened at the time of the St. Louis World's Fair in 1904, and the opening ceremony was a full formal ball hosted by the cadets of the U.S. Military Academy. While this spring's cotillion might not have been quite so formal as that West Point dance of seventy years ago, everybody really had a ball!
As the evening progressed at the first annual Red Rose Cotillion, guests exchanged romantic confidences over lime frappe punch and fingertip delicacies, including doughnuts, danish pastry, and brownies. Although not officially chaperones, Chancellor and Mrs. William H. Danforth (below) joined other faculty couples in gracing the important social event with their presence.
The Washington University community was saddened to learn of the death this past winter of a most distinguished alumnus. Harvard professor Merle Fainsod, AB 28, MA 29, LLD 56. Another distinguished alumnus, Paul Freund, AB 28, LLD 56, Harvard law professor and a trustee of Washington University, spoke at the Fainsod memorial services. We feel his moving remarks bear repetition here, at least in part, because of what he had to say about the place of the true scholar in the university and in our society:

It is not easy to speak out of a friendship of more than forty years—unbroken and unmarred. For Merle and I were nursed upon the self-same hill: undergraduates together at Washington University, serving as assistants in a course on American government under our revered mentor Arnold Lien. Each of us followed the gleam to Harvard, he remaining faithful to Political Science and the University while I defected to law and then for a time to Washington. When our ways again converged in Cambridge, so enveloping was his caring and so embracing was the hospitality and gaiety of their home, that for me, as for many others—how many!—Merle and Johnny made of a great university a loving community.

No one who knew Merle Fainsod even slightly could fail to sense his immense moral and intellectual authority. Some men, it is said, exert authority, while others radiate it. In his case both descriptions miss the mark, for they point the lines of force in the wrong direction. Respect and affection flowed to him and gave him, in spite of himself, the most irresistible kind of authority, because it derived from nature and not design. To explain this form of bonding in terms of principles of administration or theories—heaven help us—of interpersonal relations would be as futile as the effort to explain gravitation to a little uninitiate might have seemed a refuge but which in fact challenged all his gifts of learning and persuasion.

The real significance of Merle Fainsod's many episodes of service must be evident. It was this—that they were undertaken not in derogation of his commitment to a life of scholarship but in support of that commitment. He served as he did because he recognized the need to maintain and nourish the community within which scholarship could flourish. His services were undoubtedly a sacrificial digression from the individual work to which he was dedicated, but they were not a departure from his total dedication to the University where he found his habitation and his happiness. He was none of your modern breed of scholar-gypsies.

He left his deep imprint on a variety of fields. His book on American government, written with Professor Lieu, was a labor of filial piety. His writings on the regulation of the economy and on public administration have a characteristic richness of detail and sureness of perception that give a rare vitality to their subject. Above all, of course, there are the monumental Russian studies. The latter field would have lent itself easily, seductively, to exploitation by an academic pundit, but Merle scrupulously refrained, refusing to convert honest complexities of interpretation into the meretricious simplicities of the headlines. Always he probed without illusion but with trembling faith and steady will.

His life was beautifully fulfilled in all its aspects. His ever-living presence will remind us, in hours of waywardness or doubt, that the mission of the university is the steadfast and imaginative pursuit of understanding, that therein lie the duty and the joy of the scholar, and that the joy and the duty are, in the end, all one.

In the last issue of this magazine, we ran photographs of Nobel Prize winners who had done all or part of their prize-winning work at Washington University: Arthur Holly Compton, Carl and Gerty Cori, Arthur Kornberg, Alfred Hershey, Joseph Erlanger, Earl Sutherland, and Herbert S. Gasser.

This was all well and good, except that the gentleman identified as Dr. Gasser was actually Otto Loewi of Graz, Austria (as quite a few readers hastened to let us know). Reconstructing the crime, we finally realized that we had managed to compound an error first made nearly twenty years ago. We took the photograph of Dr. Loewi (alias Herbert Gasser) from a group photograph we found in our files. On the back of the photograph was pasted a clipping from a 1953 St. Louis newspaper identifying the group as "St. Louis Nobel Prize Winners," and listing the third person from the left as Dr. Herbert S. Gasser.

What Dr. Loewi of Graz was doing in a group picture of St. Louis Nobel laureates, why he was identified as Dr. Gasser, why the error wasn't caught nineteen years ago, and finally, if the error was caught then, why the incorrectly labeled picture landed back in our files, is all beyond us. Anyway, here is a picture of the real Dr. Gasser. The photograph, incidentally, is back in the files with the caption corrected so that no future editor will make the same error nineteen years from now.

Dr. Herbert S. Gasser

—FO'B
Of all of the myriad examples of the new vitality in the performing arts on this campus, the liveliest and lustiest is the student commedia dell'arte troupe, which in recent months has played to large and enthusiastic audiences on campus, appeared at the National Symphony Ball in Washington, and has been invited to perform in Italy this summer. The commedia group, which grew out of one of Frank Wersching's theatre style classes, is recreating in vivid fashion the lusty, colorful flavor of an art form that had its beginnings in the wandering troupes of players who delighted medieval audiences and inspired Molière and Shakespeare.