

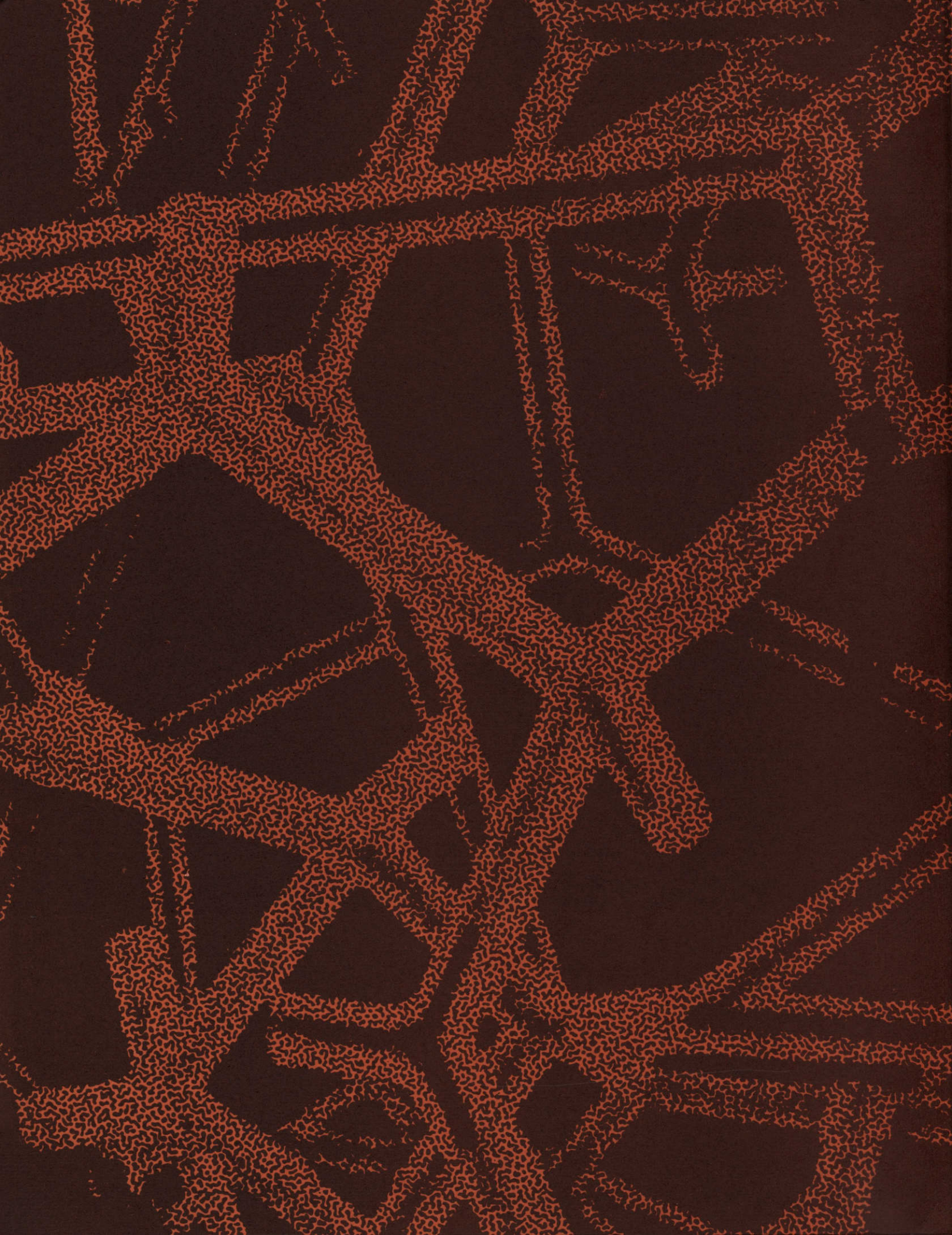
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ANNUAL REPORT 1970
SOUTHWEST FOUNDATION
FOR RESEARCH AND EDUCATION



The wisdom of God receives small honour from those vulgar heads, that rudely stare about, and with a grosse rusticity admire his workes; those highly magnifie him whose judicious enquiry into his acts, and deliberate research of his creatures, returne the duty of a devout and learned admiration. *Sir Thomas Browne (1605-1682)*

TO FRIENDS OF SOUTHWEST FOUNDATION

This is the first occasion I have had as chief executive officer to prepare a summary of the work in which we are engaged. I should like to make comment in this report on what appears to be a significant change in the public's attitude toward science and technology. It is a shift which will influence strongly the nature of the work to which we shall address ourselves in the decade just ahead. ■ I should like to use this occasion, also, to express my sincere appreciation to Dr. Harold Vagtborg, who became President Emeritus on May 1, 1970. He has done much to smooth the transition of executive responsibility. Scarcely a day goes by that he does not find some way to be helpful to me, personally, or to the Foundation. All of us are in his debt for having made such fine resources available to carry on our work. ■ We regret deeply the death, in the year just passed, of both Mr. and Mrs. Charles Urschel. These two good friends had an interest in the Foundation which was deep and abiding. The resolution adopted by the Board of Governors to honor the memory of Mr. and Mrs. Urschel expresses the high esteem in which we held them both.



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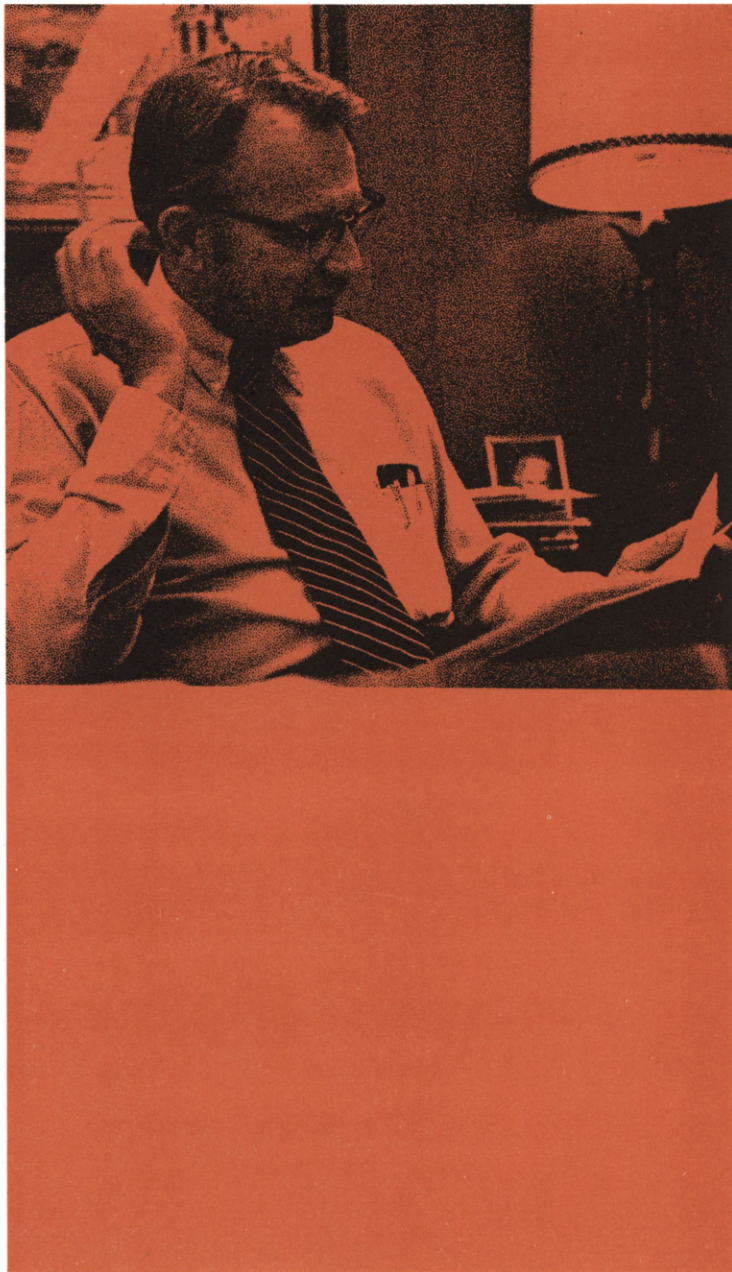
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E. C. SULLIVAN



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MEMORIAL RESOLUTION

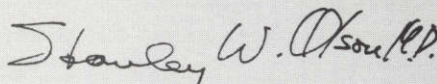
*Adopted by the Board of Governors
Southwest Foundation for Research and Education
honoring*

BERENICE AND CHARLES F. URSCHEL

The Southwest Foundation for Research and Education has sustained a grievous loss in the death of Berenice and Charles F. Urschel. Their passing leaves a void which will not be filled.

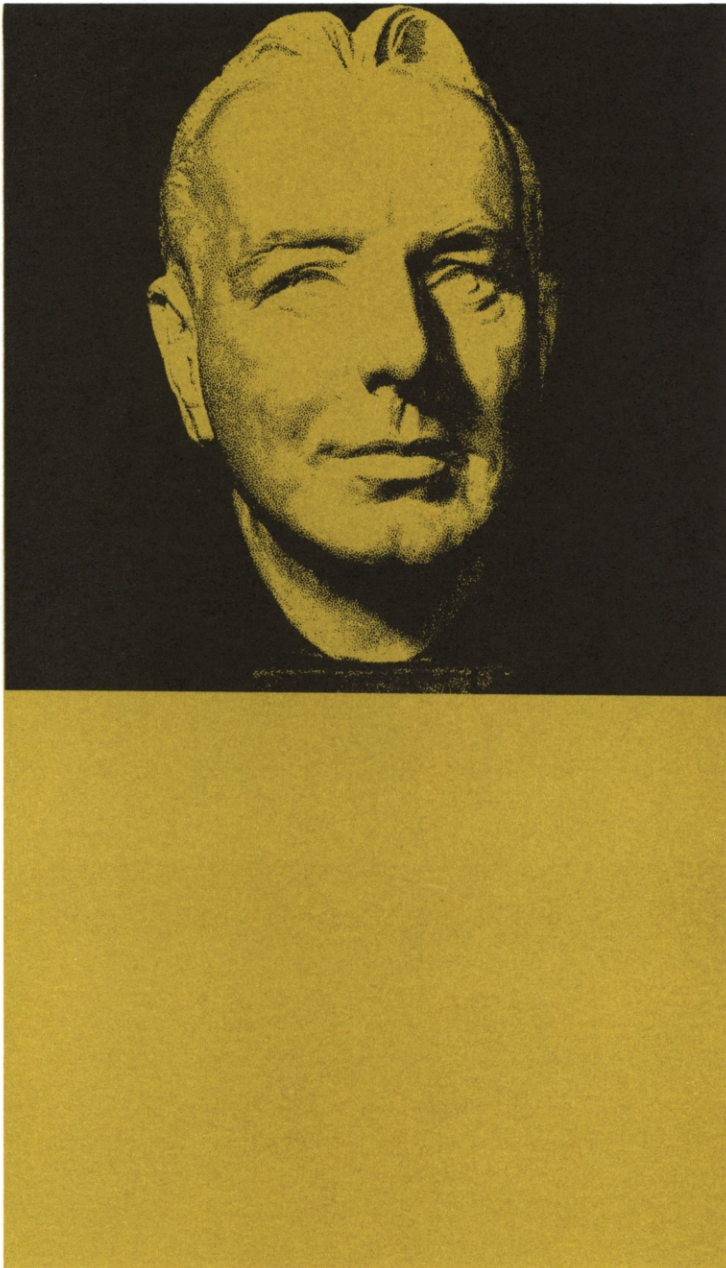
The interest and support of these two dedicated Board members have been of critical importance to the growth and development of the Foundation. Their gift of the Urschel Memorial Laboratory gave the members of the scientific staff their first modern research facilities. The construction of that building brought the Foundation's operation to its present campus and paved the way for the development of the many fine additional laboratories presently available for the conduct of basic biomedical research. Mrs. Urschel's generous provision of that share of her estate which would have gone to her son, Tom, had he lived, expresses her confidence in the Foundation and establishes a source of endowment income which will strengthen it immeasurably.

The Board of Governors, by this Resolution, expresses to the families of Berenice and Charles F. Urschel its sincere appreciation for the privilege of having known and worked with them. It extends to each member of their families its deeply felt sympathy.


Stanley W. Olson, M.D.
President


Albert W. Hartman, M.D.
Chairman, Board of Governors

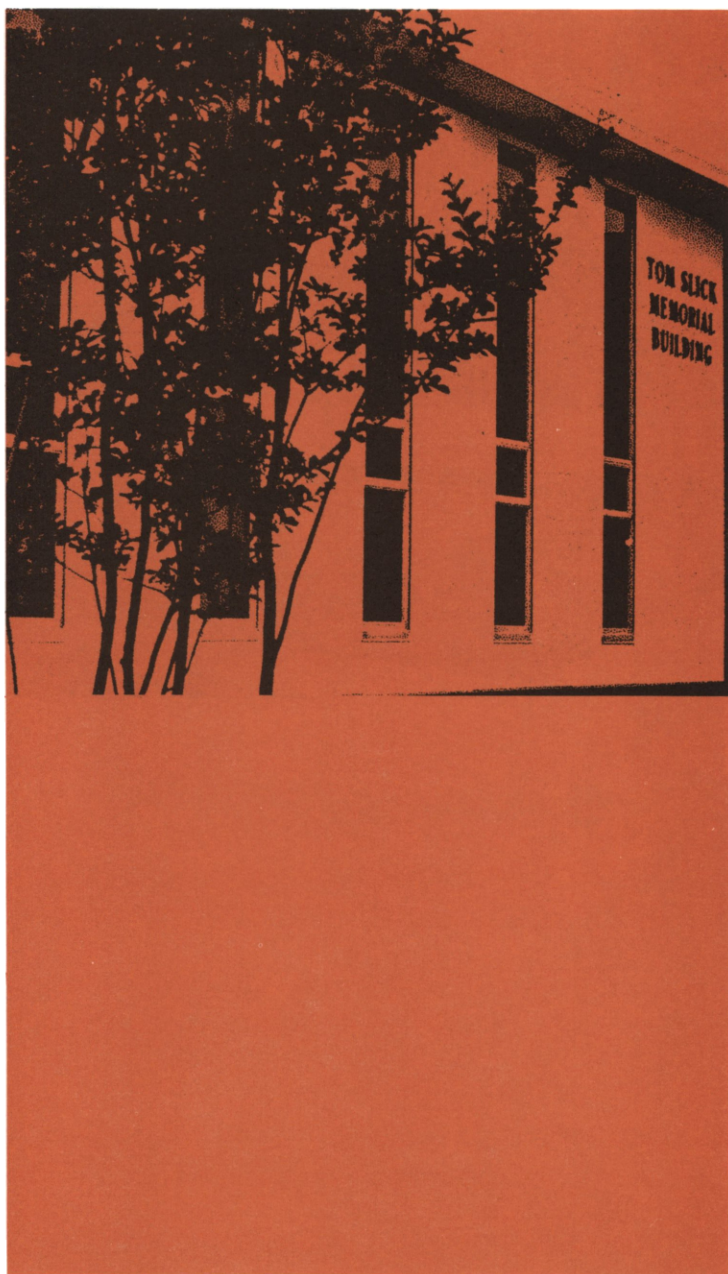
January 1971



COOPERATION BETWEEN SOUTHWEST FOUNDATION AND SOUTHWEST RESEARCH INSTITUTE

Tom Slick, who provided so much of the initiative for the establishment of these institutions, understood well their different missions in the scientific community and recognized the need for separate organizational structures. He recognized, too, their potential for making greater contributions to interdisciplinary problems by melding the competence of the Institute in the physical sciences and the expertise of the Foundation in the life sciences. ■ One of our current aims in the Foundation is to examine carefully those areas of research that can benefit from the resources available at SwRI, and to explore with the Institute problems which the Foundation's scientists can help solve. ■ A major forward step to implement this policy of cooperation was taken recently when the Boards of both institutions approved construction by the Foundation of a new laboratory building to be used by the staff of SwRI. The Institute's Department of Physical and Biological Sciences has research interests closely related to the biological areas in which Foundation scientists are working. The SwRI staff of this department will bring to our campus a resource of competence in the use of complex biophysical instrumentation. Similarly, our animal resources, our biochemical technology, and our capability in the infectious disease areas will be of importance to the SwRI group, especially in their studies on environmental pollution. ■ The field of medical information systems is another area of research in which the two institutions are cooperating. The growth in recent years of available medical information has been phenomenal because medical research has made possible so many new tests, examinations, procedures, and medi-

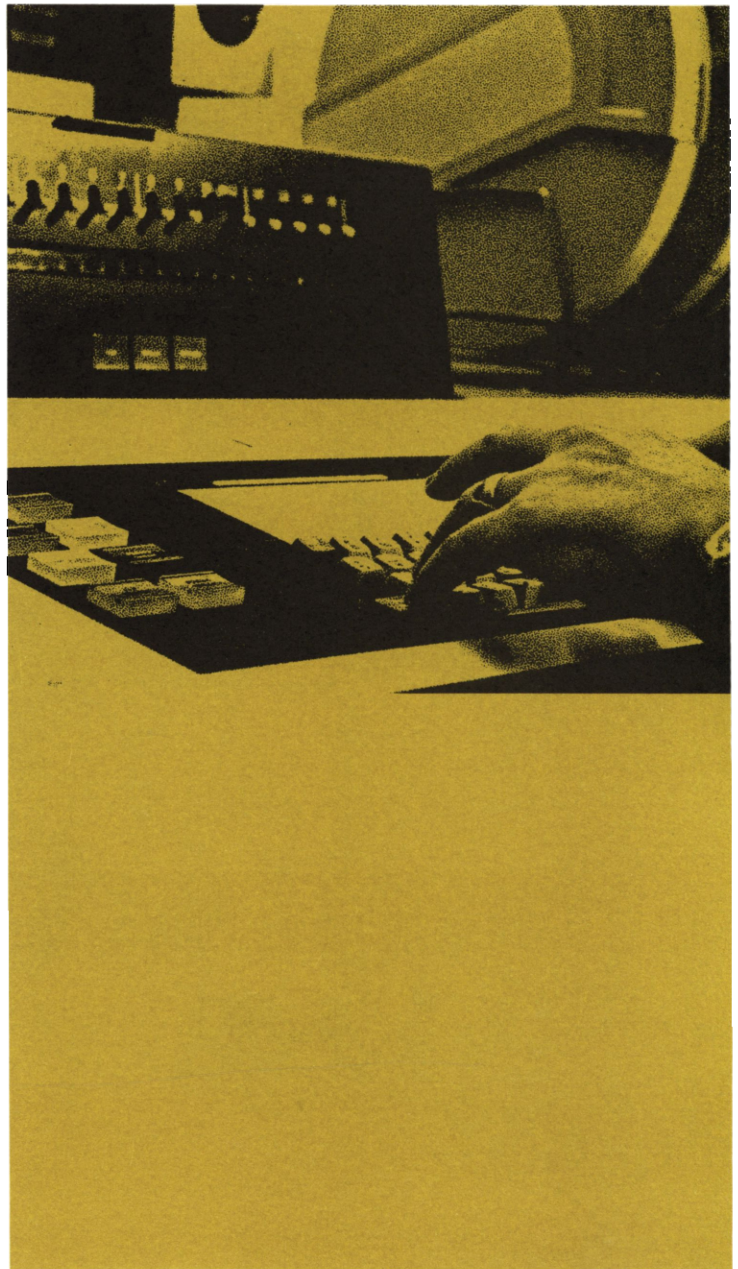


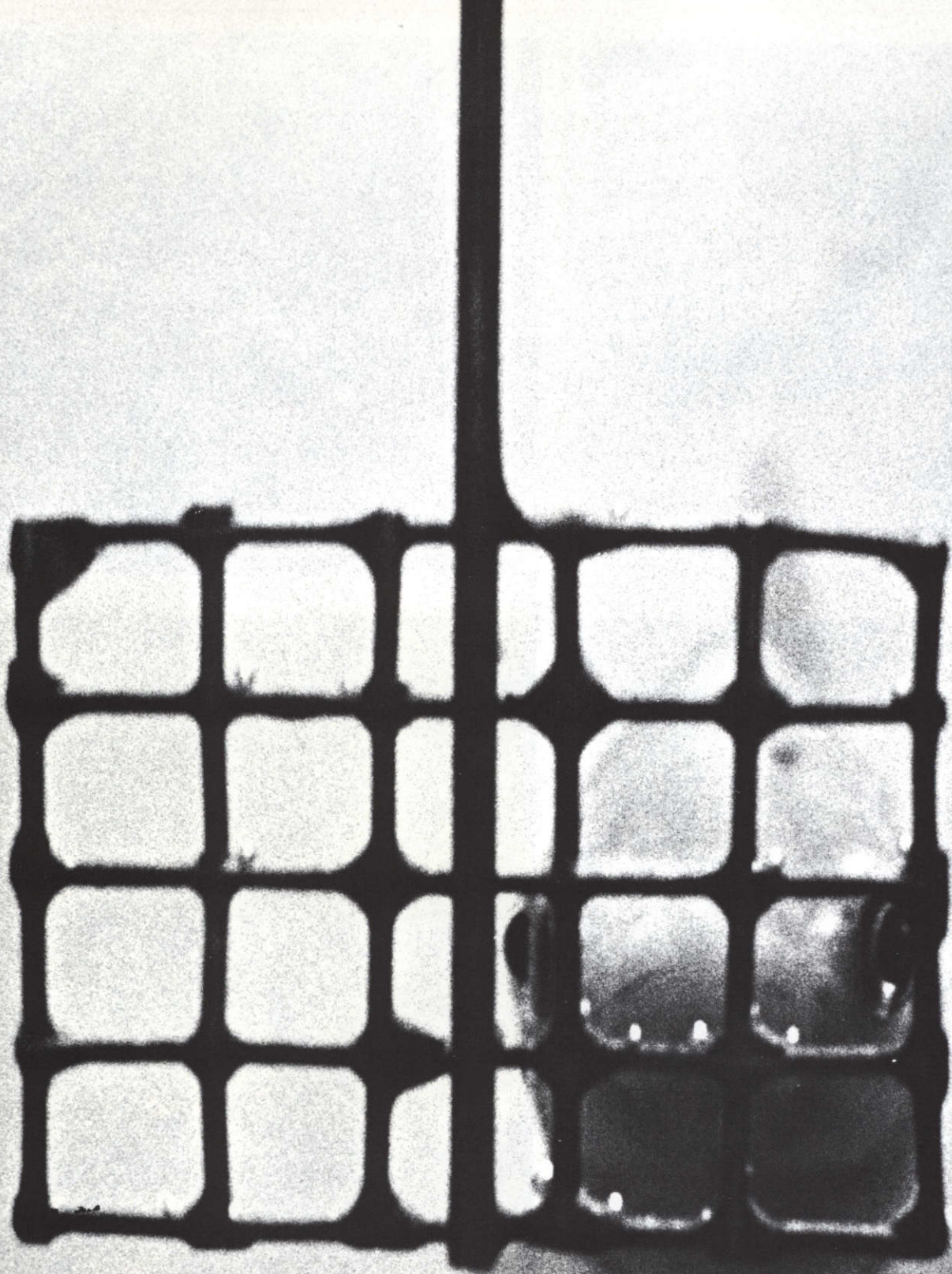


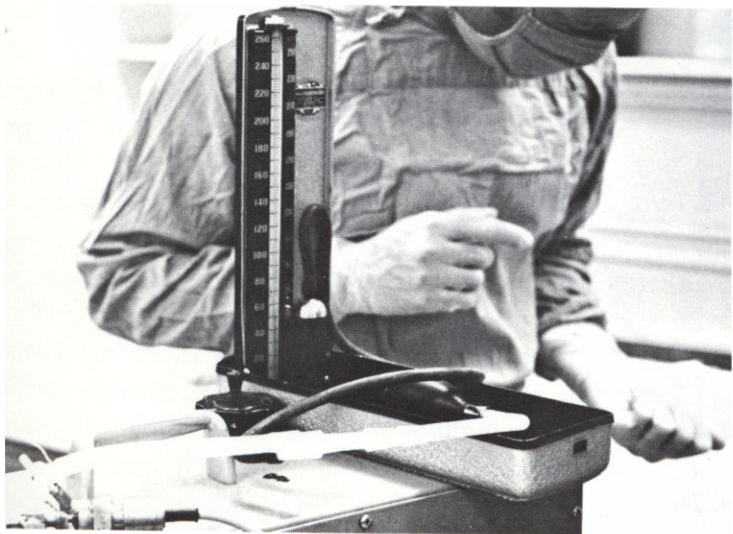
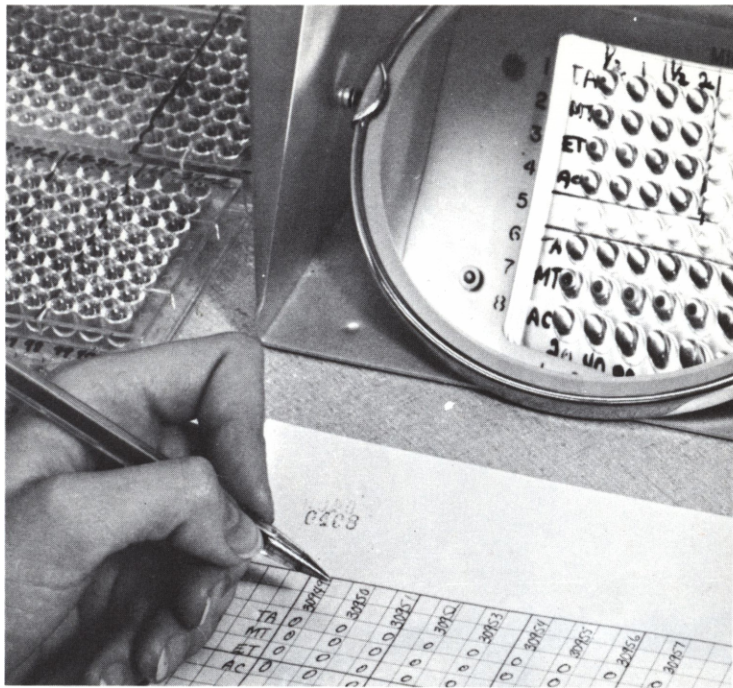
cations. Practicing physicians are having to spend more and more time dealing with this flood of information and with forms for insurance purposes. It has become increasingly difficult for them to organize the patient's medical record to handle this mountain of information efficiently. Computers have been used to solve comparable information problems in other fields, but their use in medicine is not widespread. In part, this failure to adapt the computer to medical records results from the traditional methods used to organize patient information and only now are new approaches to this field being developed; Dr. Lawrence Weed, working at the University of Vermont, is one of the leaders in this area. He has introduced and popularized the "Problem-Oriented Medical Record," as a way to systematize medical information. ■ Many developmental problems in this field will likely be resolved through the use of techniques such as operations research and systems analysis. These are fields in which SwRI has broad competence. Put together with the background of expertise available at the Foundation in medical education, health services research, and medical economics, it may be possible to provide assistance to groups of physicians, hospitals, and other institutions wrestling with problems of medical information overload.

FUNDING OF BIOMEDICAL RESEARCH The period from 1950 to 1965 will be looked upon as the "golden age" for the support of medical research. The Federal Government was presented at the beginning of this period with proposals for supporting medical education, national health insurance, and medical research. It elected to concentrate on research to the exclusion of the others and the next fifteen years saw an unprecedented growth of the Nation's capability to carry on research in health

and disease. ■ The medical advances made through biomedical research have, without question, benefited the public. But the public is asking why this vigorous pursuit of new knowledge still leaves so many health problems unresolved. On examination these remaining difficulties appear to be rooted in the health delivery system. No matter that the kind of medical research supported in the past was not intended to find answers in these areas; the public still feels frustrated that, after spending large sums for many years, so much remains to be done to assure adequate health care for everyone. Its attention and its money are directed now to the resolution of health delivery problems. ■ Medicine and medical research by no means stand alone as having failed to meet fully the public's expectation. All fields of science and technology are being scrutinized because the better way of life they offer is bought at a price which seems high in total social cost. As demands upon the public purse increase for education, transportation, urban renewal, police protection, environmental sanitation, and a host of other important public services, hard choices become necessary. The expenditures of massive amounts of Federal money for health services and lesser amounts for the training of health manpower has left fewer dollars for health research. The value of medical research is still readily apparent but it is becoming apparent that emphasis will be placed upon those research areas regarded as having the most impact on our most serious health problems. ■ The nature of basic science research is such that its immediate value often is not understood. In the prevailing climate, it may become increasingly difficult to secure Government funds to support basic research, as such. It may, therefore, be the private individuals and foundations, whose understanding of basic research





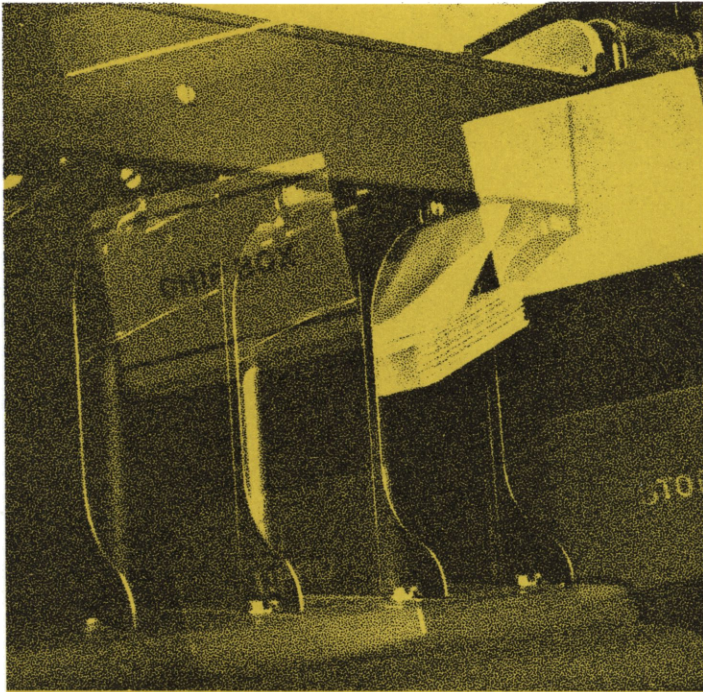


remains keen, who shall become the chief support of such efforts. And because that support will always be limited, we may have to search to identify practical applications for basic research findings in order to obtain governmental support. ■ A set of health priorities, developed by the present Administration, is now being used to guide the Federal budgeting process. The special areas to which attention and funding are being directed include: *Heart Disease*, especially the factors that predispose to heart attacks; *Cancer* with emphasis on finding specific causes and specific therapy; *Health of Children*, especially with respect to their nutrition, their growth and development, and the prevention of birth defects; *Family Planning and Population Control*; *Protection of the Public* with respect to the side effects of medications, the pollution of air and water and the wide range of hazards they pose. Fortunately, many of the research programs underway at Southwest Foundation bear directly on areas that have been accorded high national priority.

MANAGEMENT OF A RESEARCH ORGANIZATION

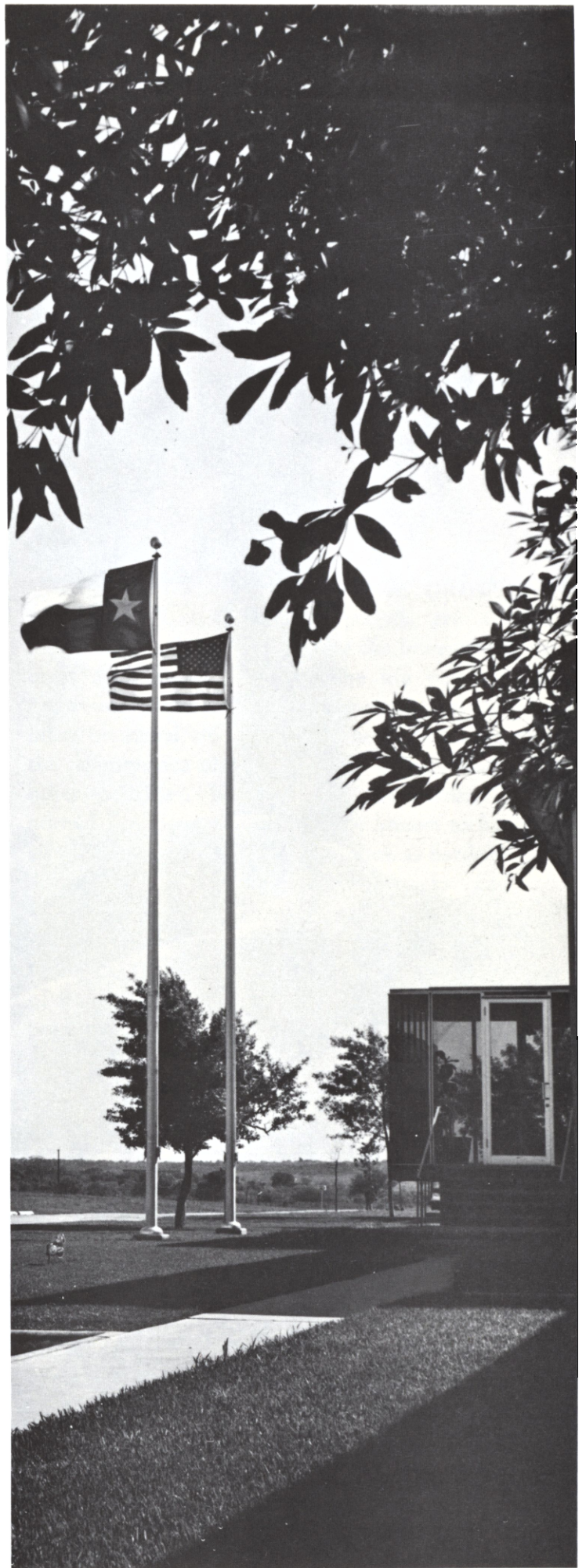
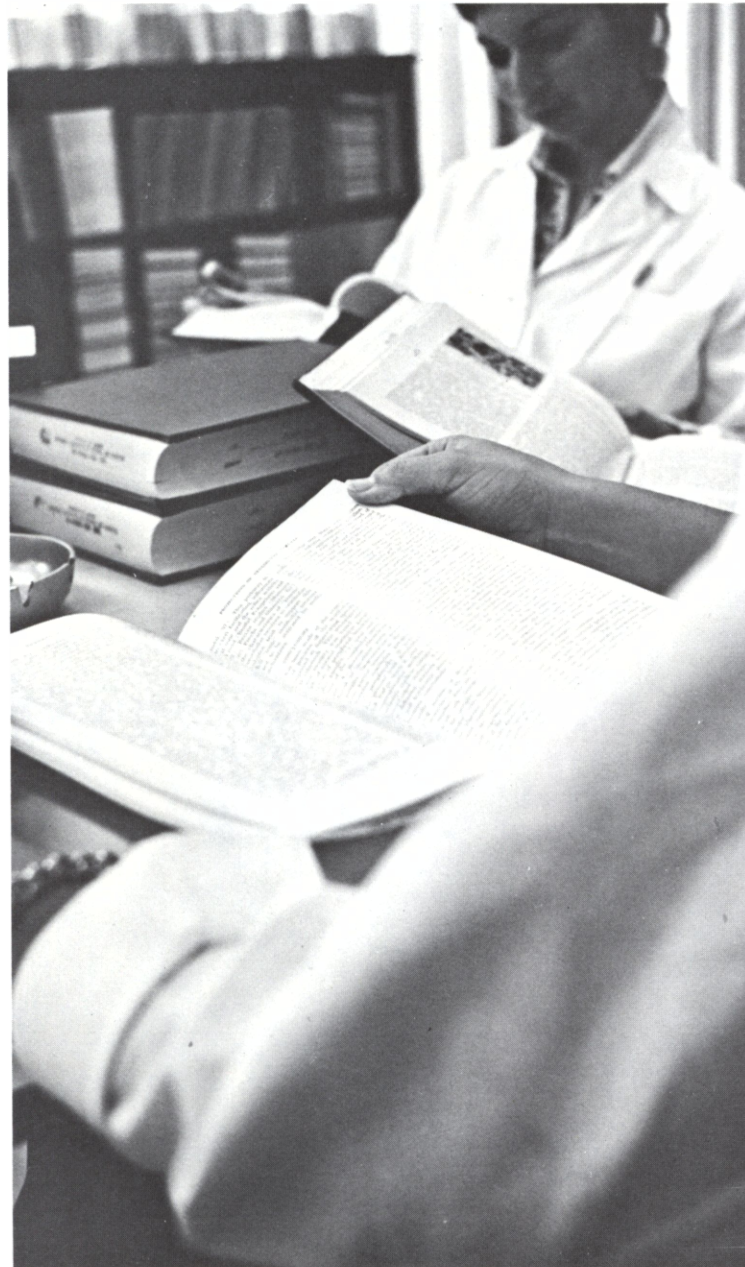
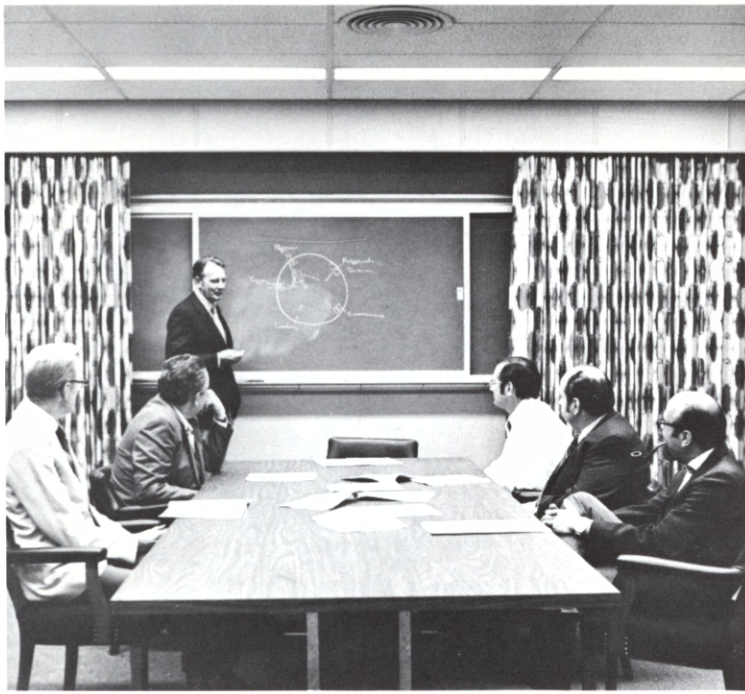
Scientists engaged in basic biomedical research require laboratories, complex research instruments, computers, animal resources, a research library, and a host of other supporting facilities. However, these are but the tools used to search out new knowledge. The driving force to elicit new knowledge is the intellect of the scientist. And the scientist is concerned as much with the overall research policy of the institution where he works as with any other aspect of his situation. It is only by participating in the development of such policy that he can insure for himself and his colleagues the freedom they all need to carry on inquiry into the basic aspects of life processes. ■ Management of a research enterprise thus becomes, in the first instance, a process of staff organi-





zation which draws the scientists into the formulation of scientific policy. To this end, the Scientific Council of Southwest Foundation has been reorganized. It now includes an elected member of the scientific staff, committees for scientific personnel, policy, library, and animal resources, and a scientific advisory committee. The minutes of the Scientific Council are circulated to inform the scientific staff of the Council's actions. Management also includes effective implementation of policy. To this end, steps have been taken to improve personnel appointment procedures, to guarantee equal employment opportunity, to coordinate all financial operations in a single budget, and to institute centralized control of the fiscal aspects of our large primate animal colony. ■ We have available, through the generosity of our Research Patrons, certain funds to support new research projects. The General Research Support grant from the National Institutes of Health also serves this purpose. Our ability to compete effectively for research funds will depend, in large measure, on our success in using these discretionary funds effectively to support new ideas and to accumulate confirmatory data which can give substance to our research proposals. ■ It is my view that effective management of a basic research effort involves a balanced approach which uses the insight of scientists into their own fields, which then supports their efforts with good administrative practices, and which channels discretionary funds into new and promising areas of investigation. I have used the past year to begin the implementation of this approach to management.

Stanley W. Olson, M.D.
Stanley W. Olson, M.D.
President



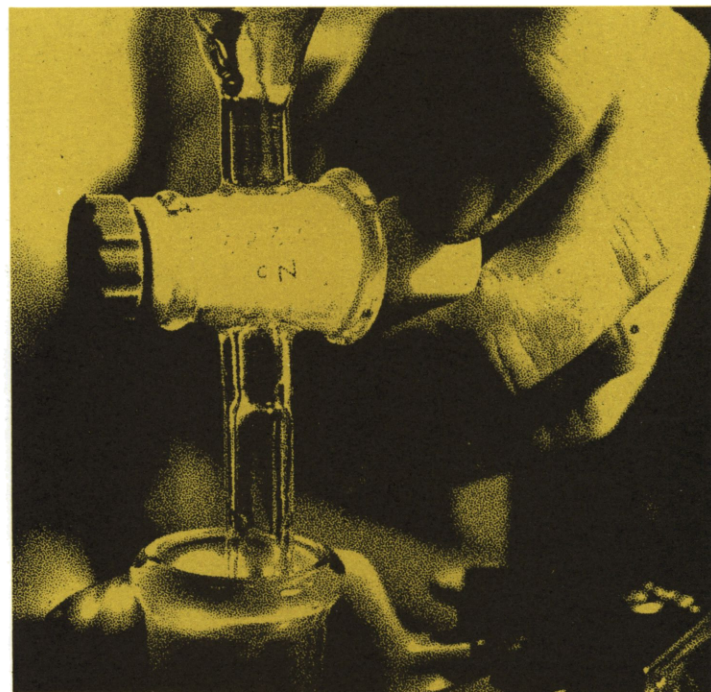


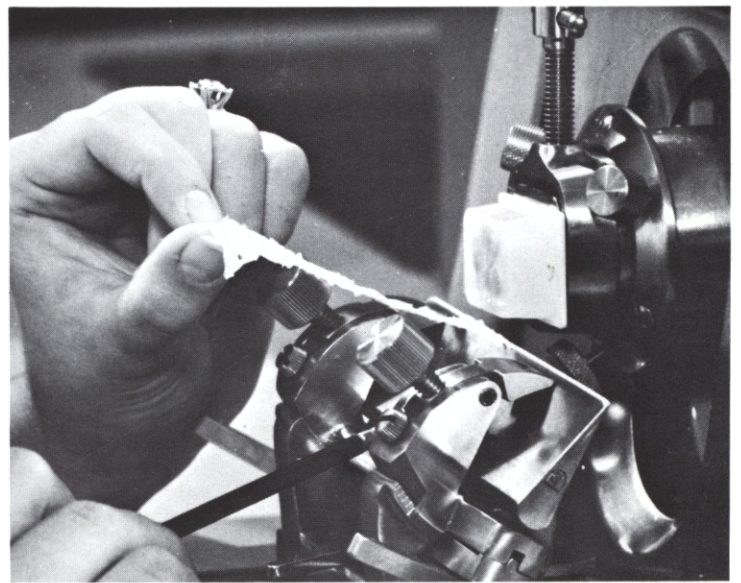
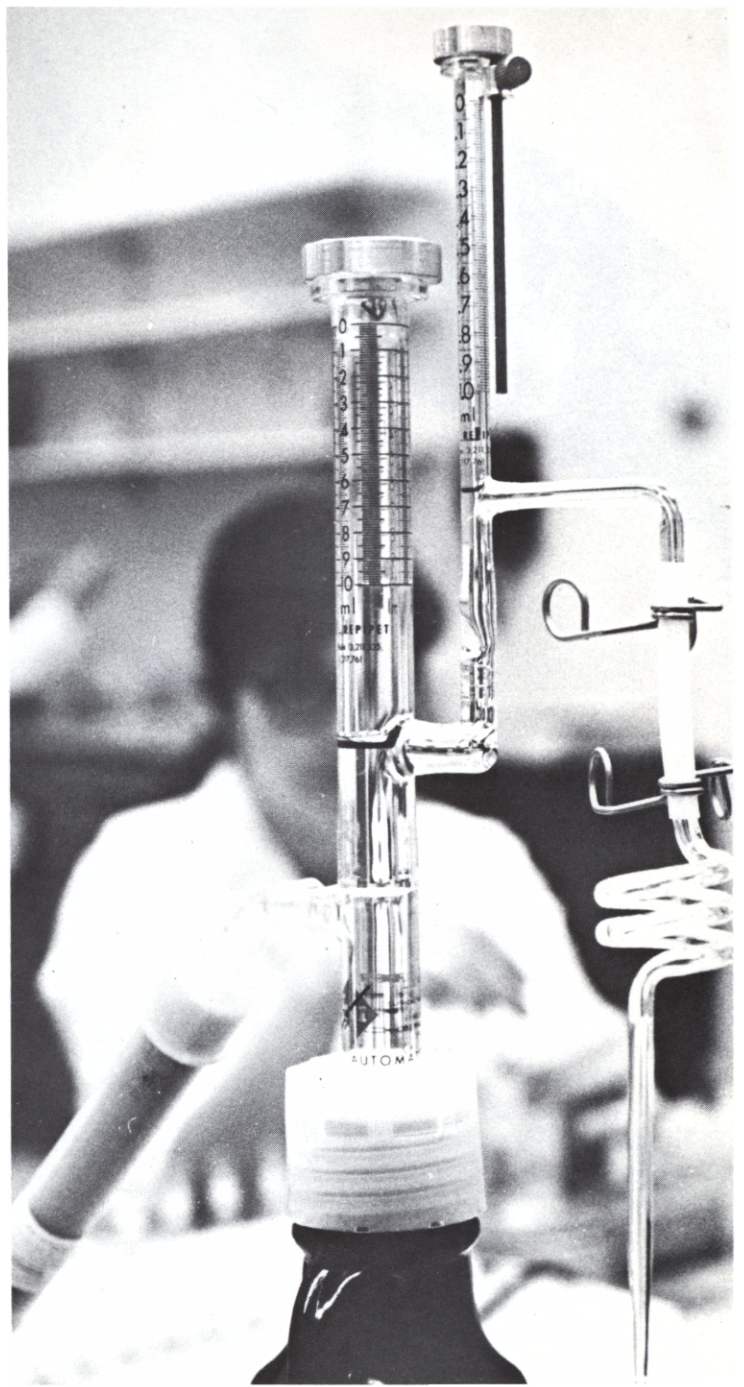


THE DIVISION OF BIOLOGICAL GROWTH AND DEVELOPMENT

Steroid compounds are a class of biochemical substances found in the human body which exert a profound effect on the life processes. These hormones regulate normal functions, such as the development of sexual characteristics, the reproductive process, the maintenance of salt and water balance, and a host of other activities. Beyond their involvement in these normal functions, the steroids are known to be involved also in important disease states, such as hardening of the arteries (atherosclerosis), heart attacks and stroke (thrombo-embolism), cancer, and metabolic disorders such as rheumatoid arthritis. ■ The Division of Biological Growth and Development is involved in studies of how the body normally secretes and uses the steroid hormones and in studies of the effects of these compounds in disease states. The biochemical analysis of steroids and of the tissues they affect requires highly complex techniques and elaborate equipment. ■ Extensive work is underway to produce in animals the kind of fatty blood vessel disorders that lead to heart attacks and strokes. This result is accomplished by feeding diets high in the same fats that characterize the affluent American diet. The effort to produce this condition has been highly successful and it lays the groundwork for devising means for getting rid of the fatty deposits. Hopefully, these methods will be applicable to the same process in humans. ■ Other studies have been undertaken to grow, in the laboratory, normal and cancer tissues taken from the prostate gland. The effect of the male steroid hormones on these tissue culture preparations is being studied as the first step in a sequence that will later involve animals and, if successful, may find application also in the treatment of human

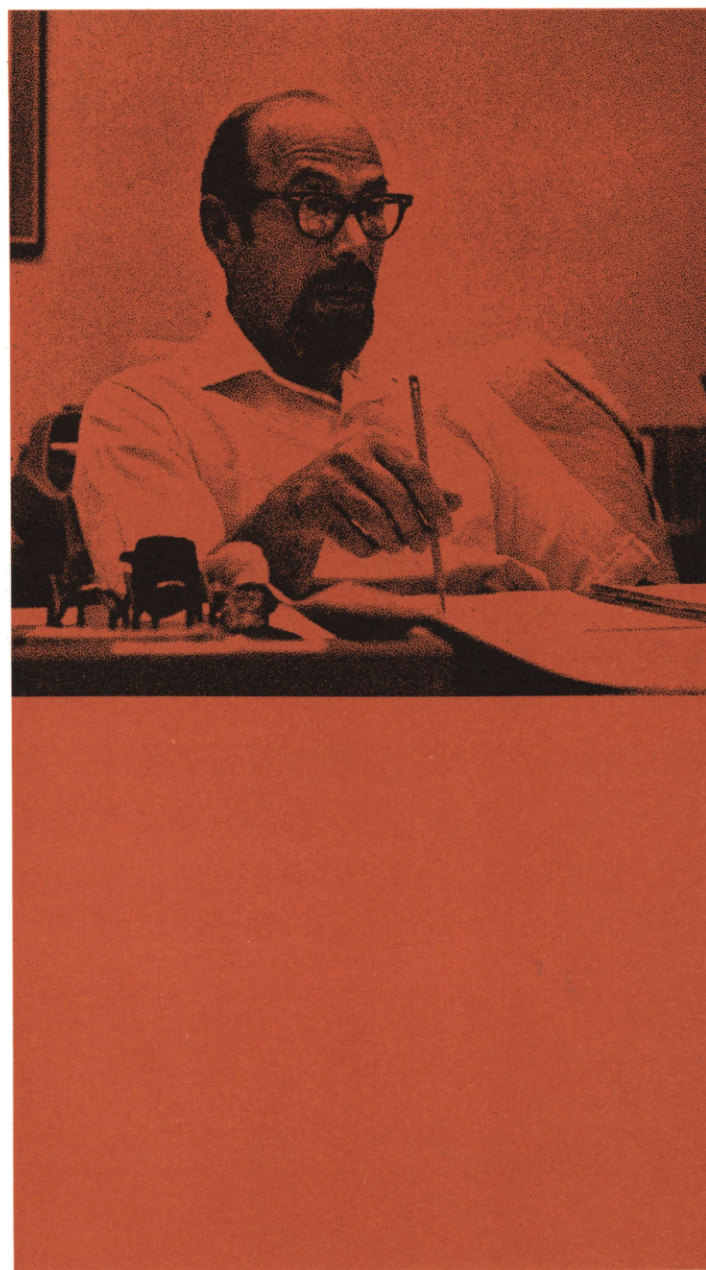
prostatic cancer. ■ Because of the great importance of steroids in the reproductive process, close collaboration has been established with the Division of Clinical Sciences, which is actively concerned with the biology of reproduction. ■ The brain is not only an incredibly complex arrangement of nerves, cells, fibers, connectors, and supporting tissues, but it carries out chemical activities which are even more complex than its anatomical structure. These chemical reactions create electrical impulses which provide the basis for many of those qualities we regard as distinctly human—learning, memory, thought, feeling, and mood. The gigantic task of piecing together bits of information in order to understand the total mental process has already begun in laboratories throughout the world. We are involved in a small segment of that huge effort. The Department of Molecular Biology is studying a substance known as acetyltransferase. We have also developed a technique for isolating in animals the blood flow to and from the brain in order to study biochemical transformations within the intact brain. ■ Important studies are underway to determine methods for successfully implanting synthetic materials into the tooth socket as a means of replacing teeth. The Dental Section is studying, too, ways to produce cancer of the cheek in experimental animals. This type of cancer is a major problem in countries where the population chews betel nut.

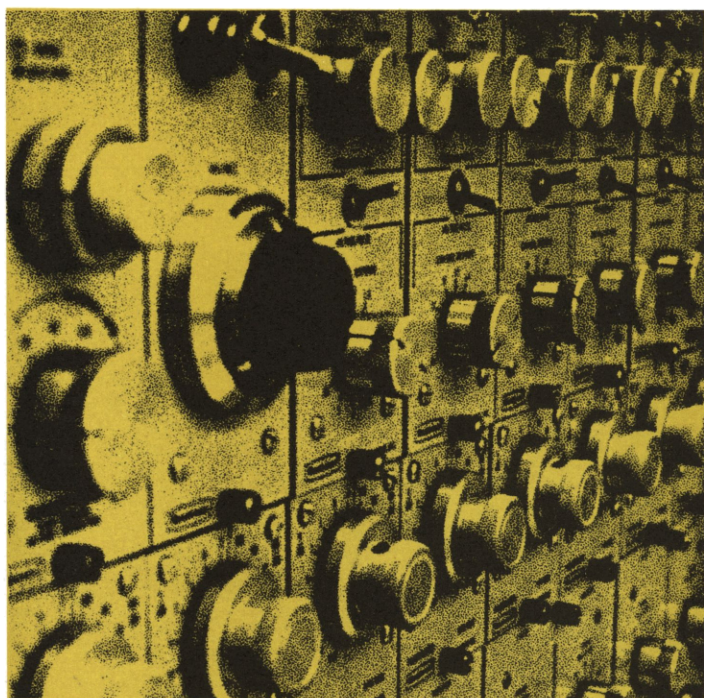




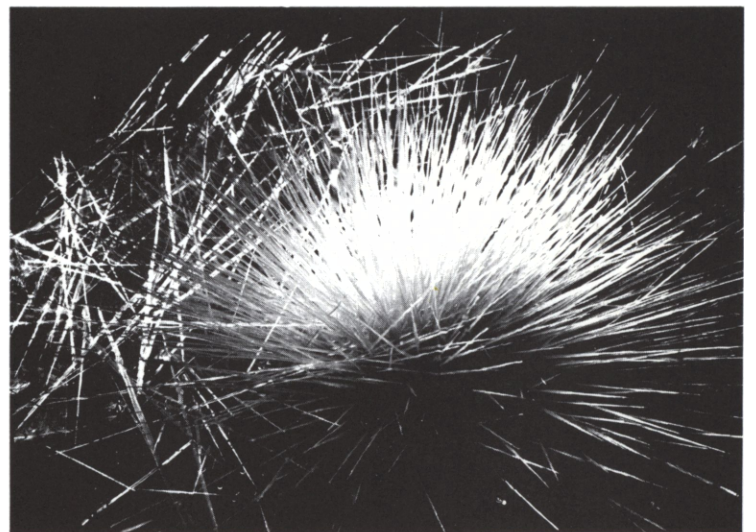
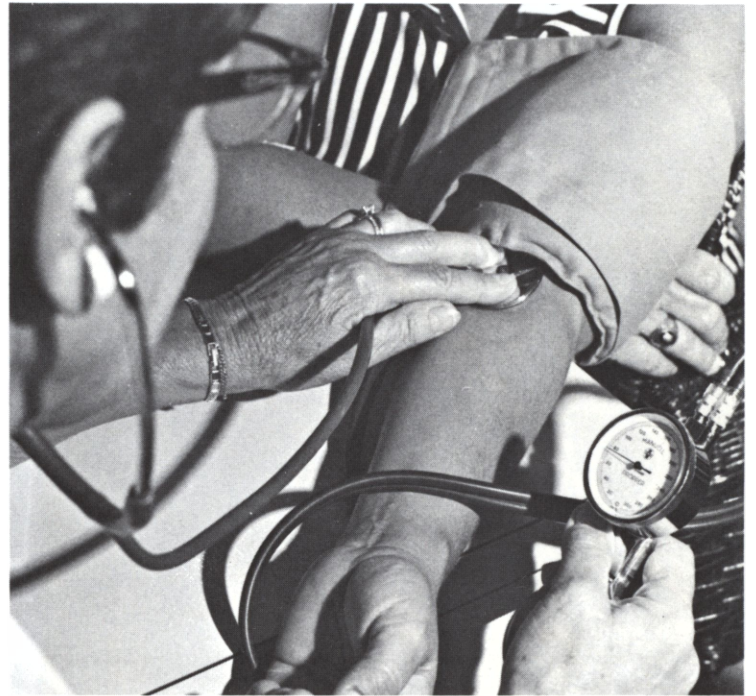
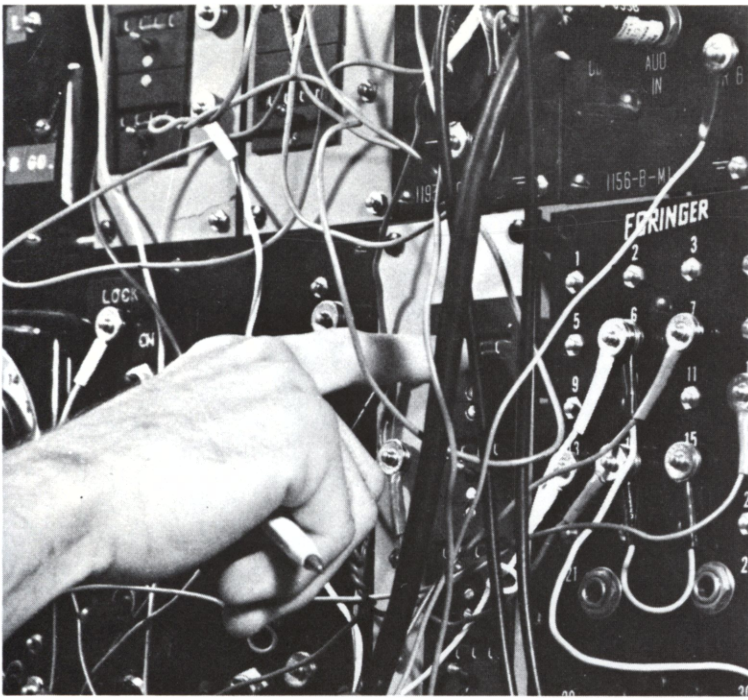


THE DIVISION OF CLINICAL SCIENCES A major consequence of man's triumph over death from infectious diseases is a tremendously rapid growth in the world's population. Although the birth rate today is lower than in centuries past, it greatly exceeds the death rate and the total population is now climbing at a frightening rate. This phenomenon presents us with problems relating to nutrition, housing, education, jobs, and recreation that exceed any we have faced in the past. ■ What to do about population control is by no means clear. The use of the oral contraceptive has become widespread but it is not without known hazards and may present other problems which we do not fully understand. Nevertheless, it is the most effective method known and it is imperative that we obtain accurate information about its effects. ■ The Division of Clinical Sciences has undertaken a three-year study of the complications of oral contraceptives. Involved in this undertaking are experiments to learn more about how the chemical compounds used affect the reproductive system, about their effect on blood vessels, and about long-term complications. ■ Recently completed and presented to the profession is a controlled study of the untoward symptoms attributed to the use of oral contraceptives. A carefully controlled double-blind study has shown that the incidence of headache, depression, weight gain, nausea, and other "symptoms" directly attributable to compounds used to prevent pregnancy is much less than previously believed. ■ The principle of comparing the risk of prescribing a drug to the dangers of the disease for which it may be an effective cure is well established in medicine. Serious diseases warrant the use of drugs with dangerous complications. In the case of oral contraceptives, the risks of pregnancy must be balanced against the risks of using





the drug. Nevertheless, the likelihood that millions of women may take these compounds for the twenty-five to thirty years that comprise their child-bearing period magnifies the possibility of harmful effects even when they occur very infrequently. There is great justification, therefore, in looking for better methods of population control and Southwest Foundation is engaged, as are many other research institutions, in understanding better the entire reproductive process. We are looking particularly closely at the role played by the brain in regulating the hormones involved in reproduction. In addition, we are conducting experiments to determine how agents other than steroids affect the endocrine system. A new class of substances, called prostaglandins, seems particularly suitable for careful study. ■ The Department of Experimental Pharmacology is working on several problems of great importance. They include studies on alcoholism, the effects of nicotine on behavior, and the effects of tranquilizing drugs. Alcoholism is difficult to induce in experimental animals but we have been able to show that subjecting rats to darkness for long periods will result in their taking alcohol in preference to water. This development opens up ways for studying behavior patterns associated with drinking and the effects of drugs in controlling alcoholism.







THE DIVISION OF MICROBIOLOGY AND INFECTIOUS DISEASES

One of the great achievements of modern civilization is our ability to protect the public from the ravages of infectious diseases. We have accomplished this result in great part by preventing bacteria from contaminating our food and water. With the advent of antibiotics, we have learned how to counteract the bacterial infections already established in the body.

■ Virus infections, however, have been harder to overcome, chiefly because we have known so little about them. Quite recently, we have developed vaccines against polio, measles and German measles, and have made progress against hepatitis and other viral diseases. Protection against the viruses causing the common cold, influenza, encephalitis, and many other virus-caused diseases remains incomplete.

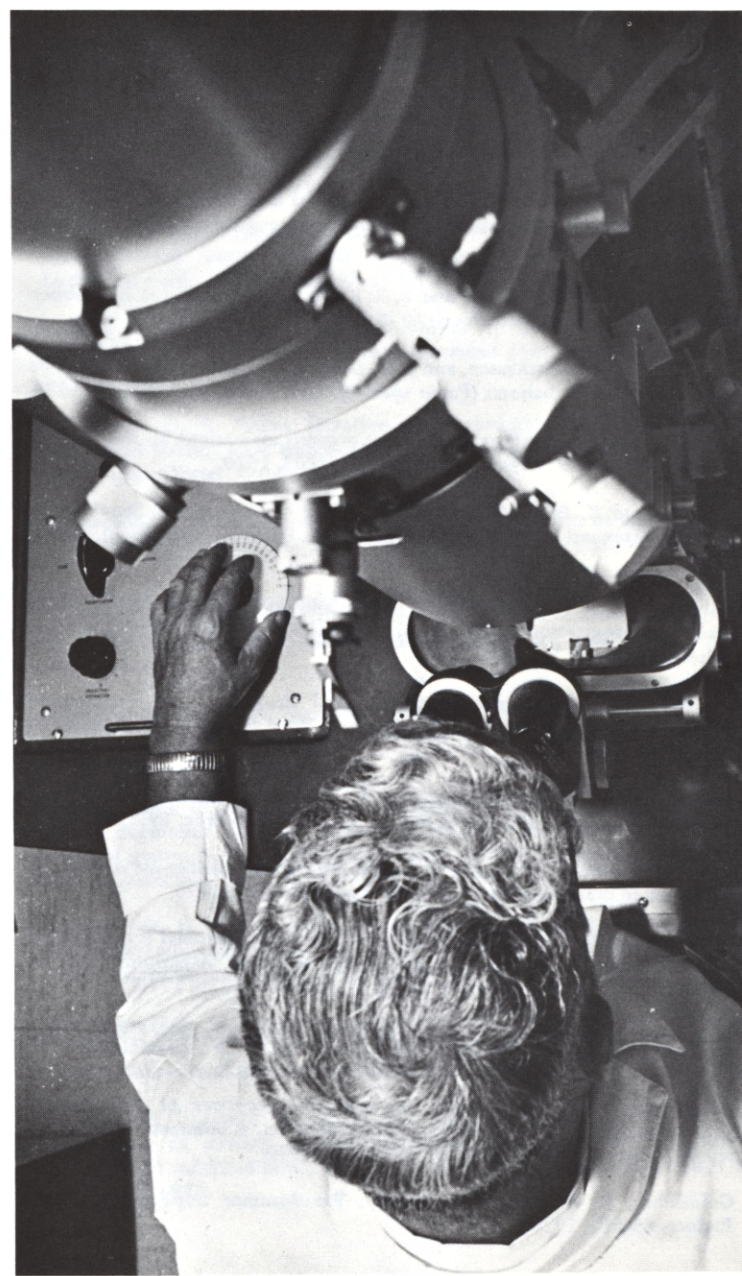
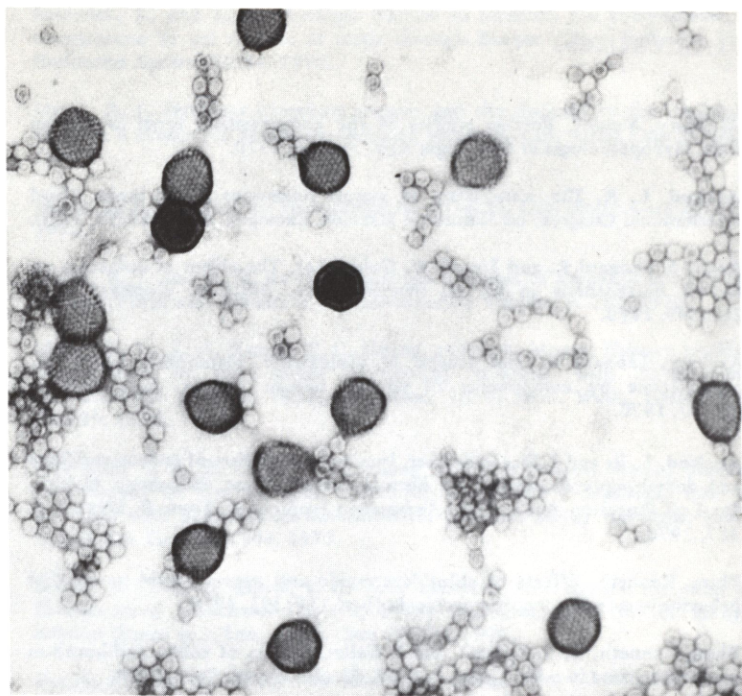
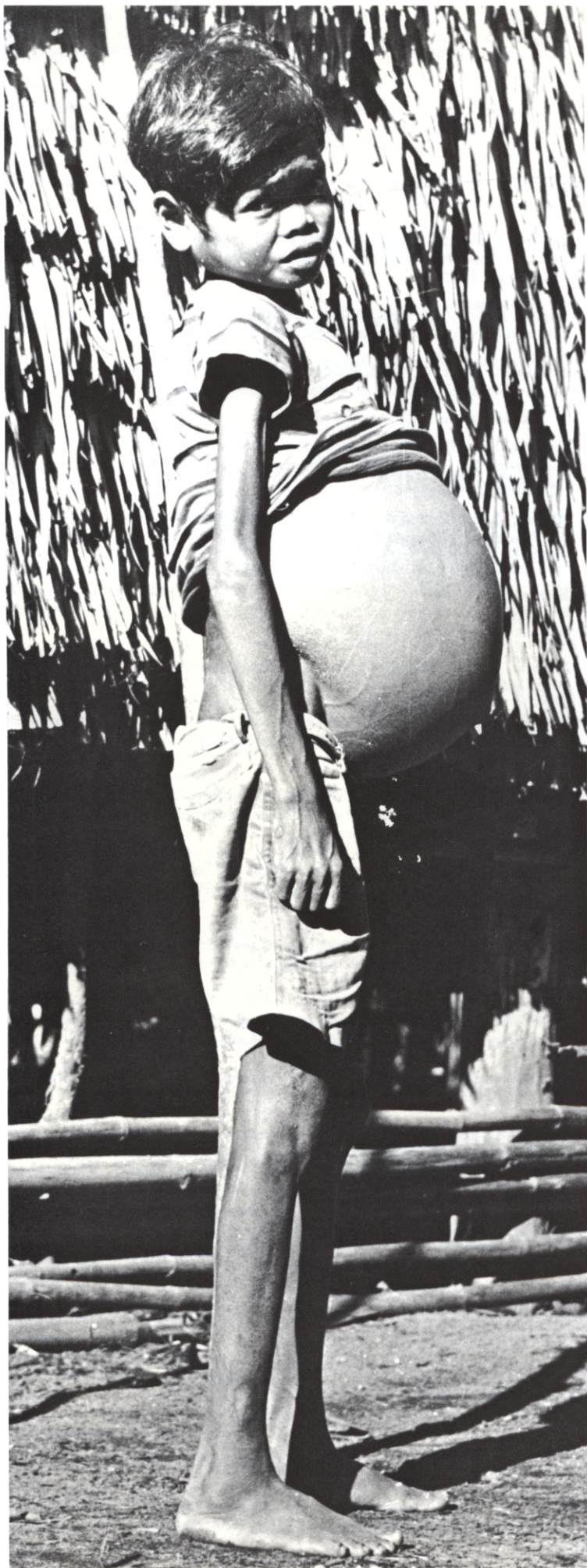
■ Our growing knowledge of viruses has led to the identification of specific viruses as a cause of cancers in animals. A growing suspicion now exists that they may be a major cause of human cancer as well.

■ Southwest Foundation's Division of Microbiology and Infectious Diseases has made extensive studies of viruses in various monkey species. This important step is a prelude to the wider use of nonhuman primates to study the virus diseases that affect man. These include cancer-producing viruses, those that may play a role in causing multiple sclerosis, the viruses of rubella and cat-scratch fever, and many others. The problems currently under investigation range from identification of the viruses to studies of how they produce malformations in newly-born infants. Immunoglobulins are the chief component in the blood protecting the body against infections. Studies of their action in animals have given us a better understanding of the crucial role they play in human infections.

■ In this country, those of us

who enjoy a high standard of living have been able to rid ourselves of the dangers caused by parasites. A huge proportion of the world's population still stands at risk, however, from this type infestation. Except for malaria, schistosomiasis is the most prevalent parasitic disease known. It is transmitted to man through an intermediary step that takes place in snails. Field workers in Egypt and elsewhere wade in snail infested waters and contract the disease regularly with debilitating effect. Cancer of the urinary bladder is a particularly distressing complication of schistosomiasis. ■ Scientists at Southwest Foundation have carried out numerous experiments to learn how schistosomiasis develops within the body and, particularly, to find out how resistance to its spread may be enhanced. Recently, bladder tumors have been produced experimentally in our laboratories by inoculating primates with schistosome parasites. These tumors have now been declared by several pathology consultants to be cancerous. We have thus established an important experimental model for the effective study of a wide-spread human disorder.





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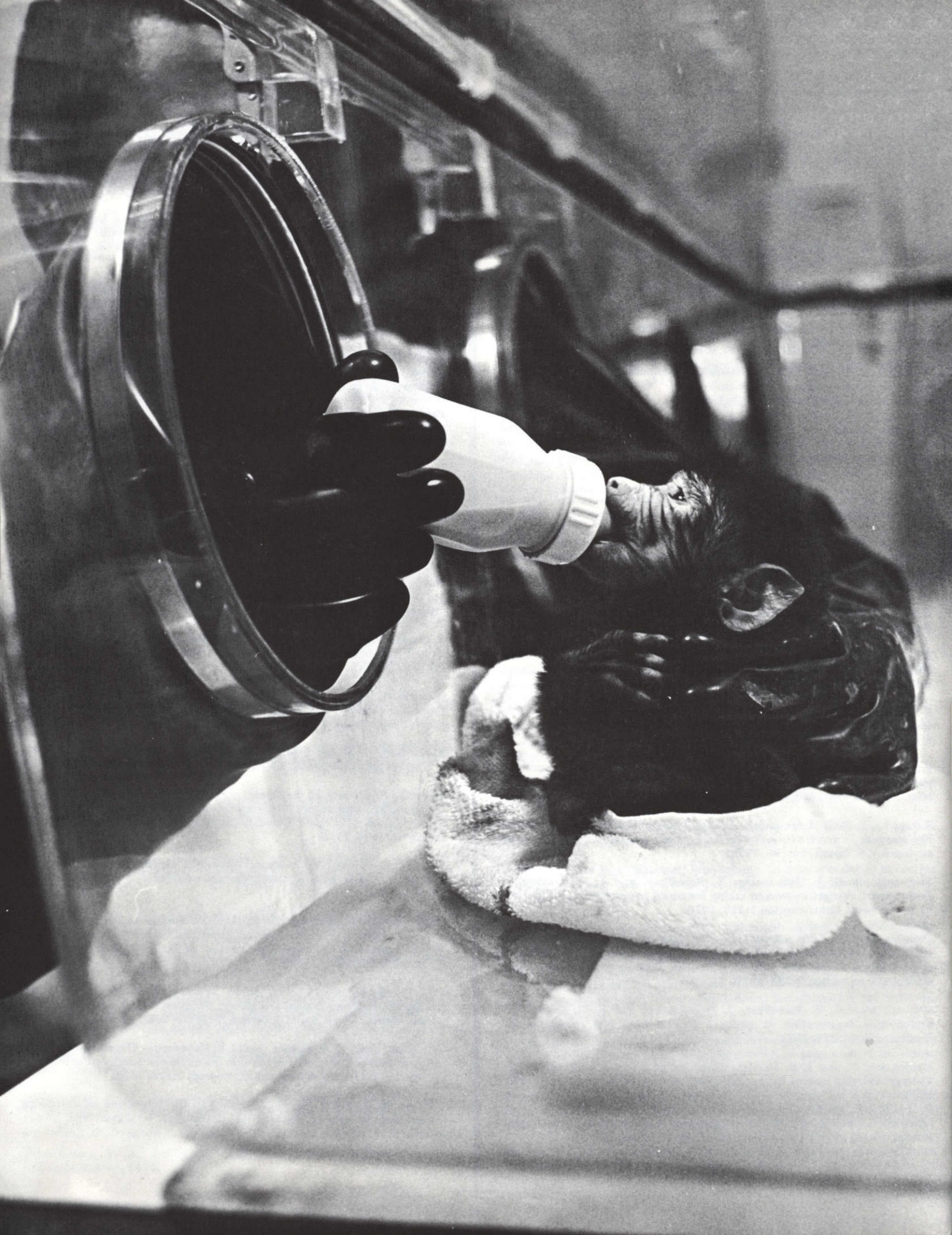
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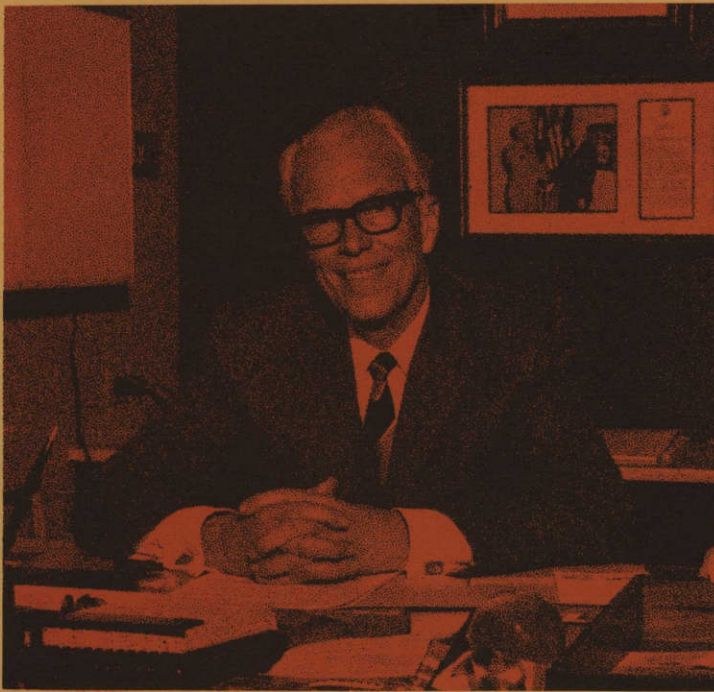
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Statement of Revenues and Expenditures

Year ended December 31, 1970

Revenues:

Grants in aid	\$1,714,765	
Contracts	<u>316,927</u>	\$2,031,692
Contributions		416,918
Endowment fund earnings		98,437
Rent		45,000
Oil and gas royalties		16,390
Other		<u>21,070</u>
		2,629,507

Expenditures:

Direct project costs—grants	\$1,427,745	
—contracts	<u>243,037</u>	1,670,782
Finalization of provisional indirect cost rates - net		1,314
Divisions		158,638
General and administrative		597,152
Fund raising		11,135
Essar Ranch		<u>2,822</u>
		2,441,843

EXCESS OF REVENUES OVER EXPENDITURES 187,664

Depreciation

EXCESS OF EXPENDITURES AND DEPRECIATION OVER REVENUES (101,363)

Capital contributions	107,302	
Bequest - restricted	291,700	
Excess of assets over liabilities received from		
The Population Crisis Foundation of Texas	<u>5,465</u>	404,467
	INCREASE IN EQUITY	303,104

Equity at December 31, 1969

4,395,254

EQUITY AT DECEMBER 31, 1970

\$4,698,358

Balance Sheet

December 31, 1970

ASSETS

Cash			\$ 79,742
Due from sale of stock			96,490
Marketable securities - at cost (market value \$207,522)			212,357
United States Treasury bills - at cost and accrued interest			117,184
Accounts receivable			50,915
Note receivable			30,000
Contracts receivable from research projects			930,003
Amounts due on authorized grants in aid:			
National Institutes of Health	\$ 679,599		
Other	90,857		770,456
Prepaid expenses, supplies, and refundable deposits			17,719
Investments:			
Buildings not used in operations - at cost	\$ 478,019		
Less allowances for depreciation	306,071	171,948	
The Argyle land, buildings, and equipment at cost	481,211		
Less allowances for depreciation	296,776	184,435	
Oil and gas royalties		1	
Endowment funds - restricted:			
United States Treasury bills - at cost and accrued interest	1,000		
Corporate stocks - at market value on date contributed (approximately market)	291,700	292,700	649,084
Property, plant, and equipment - at cost or estimated fair value on dates contributed:			
Land		790,078	
Buildings and improvements	3,043,575		
Fixtures and equipment	1,687,173		
	4,730,748		
Less allowances for depreciation and amortization	1,398,361	3,332,387	4,122,465
			<u>\$7,076,415</u>

LIABILITIES AND EQUITY

Accounts payable and accrued expenses:			\$ 62,540
Trade accounts			
Accrued wages and amounts withheld from employees for taxes and insurance			28,934
Other payables and accrued expenses			3,896
Grants payable			40,000
			135,370
Unearned contract revenue from research projects			921,982
Amounts unearned on grants in aid:			
Advance collections	\$190,168		
Uncollected authorized grants in aid	770,456	960,624	
Note payable to Estate of Tom Slick, unsecured, due on demand, dated May 1, 1967, noninterest bearing			350,000
Notes payable due in monthly installments of \$420, including interest—with certain equipment as collateral			10,081
Equity			4,698,358
			<u>\$7,076,415</u>

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