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The Jefferson Commitment to Biomedical Research

Medical research is an endeavor ranking with medical education at Jefferson, says Graduate School Dean Robert C. Baldridge.

TJU Research: Activity and Productivity

Jefferson scientists detail current projects in five representative research areas.

Extramural Jefferson Researchers

Alumni investigators are making scientific contributions in a variety of disciplines and settings.

Philadelphia’s Restaurant Renaissance

If you haven’t been to Philadelphia since your last JMC reunion, your gastronomic sensibilities are in for some pleasant surprises. A pull-out review/guide for Jefferson’s reunion visitors.

On the Cover: At the Stein Research Center this anechoic chamber is part of the equipment for a project measuring the effects on the developing embryo of exposure to microwave radiation. The styrofoam cones that line the chamber prevent the microwaves from bouncing off the walls by absorbing them.

Jefferson Scene

Obituaries

Class Notes

Published four times a year, Fall, Winter, Spring, Summer

The Alumni Association of Jefferson Medical College
1020 Locust Street, Philadelphia, Pennsylvania 19107
"Ours is a medically-oriented University, and as a University is characterized by its commitment to an intellectual life of inquiry and transmission of knowledge—research is an endeavor ranking with education." So spoke President Peter A. Herbut in a report on University policies and their impact on research at the December, 1975 meeting of the Board of Trustees.

His report was an outcome of a series of studies which began following the publication in December, 1972 of the Report of the Master Planning Committee of the Board of Trustees. At that time, members of the faculty noted that the Master Planning Report, while spelling out in detail the status and future needs of our educational and patient care programs, did not emphasize the role of research in our University. In response, Mr. Frederic L. Ballard, Trustee Chairman of the Committee, appointed a Task Force on Research chaired by Trustee James W. Stratton to study the matter. The members of the Task Force were: Trustee Dr. Orville H. Bullitt, and faculty members Drs. Robert C. Baldridge, Robert L. Brent, Stephen I. Bulova, Joseph S. Gonnella, George F. Kalf, Simon Kramer, Hyman Menduke, Abraham E. Rakoff, Jussi I. Saukkonen and Martin Wingate.

The Task Force, meeting monthly for over a year, reviewed the organization

Dr. Baldridge was appointed Dean of the College of Graduate Studies in March, 1970. He is an honorary member of Jefferson's Alumni Association.
for and administration of research, the University commitment to research, the role of students in research and the available methods for evaluation of research. The report of the Task Force, including a series of recommendations, was discussed and debated at several meetings of the Master Planning Committee, and as an outcome, a series of recommendations were transmitted to the Board of Trustees.

Following is a summary of the resolution based on the recommendations that was approved by the Board at its June, 1975 meeting.

1. The Medical College Committee and the College of Graduate Studies Committee should accept increased responsibilities for research. The members of these Board Committees are urged to devise procedures, with the assistance of the appropriate Deans, to become more informed and aware of the research activities of the University. The Executive Committee at its meetings will receive reports of these two committees and share appropriate reports with the full Board.

2. The members of the Finance Committee and of the Resources Committee should determine the feasibility of allocating internally derived funds and of raising additional funds from external sources for intramural research.

3. The President should be urged to appoint a University faculty advisory committee on research to assist him in presenting annually at a meeting of the full Board of Trustees, a report of the status of research in the University and the impact of University policies on the research activities of the faculty. This report would include a summary of steps taken to enhance the research capabilities of the University. The report should also include a review of federal policies regarding the funding of research grants and research training grants.

Steps are being taken to implement these resolutions: members of the faculty are meeting with the Board Committee to describe their ongoing research projects; and the Resources Committee of the Board will consider the feasibility of including funds especially earmarked for research as one of the goals of Phase II of the Sesquicentennial Campaign.

In his report, Dr. Herbut noted that nationally, federal funding of research via the National Institutes of Health (NIH), has leveled off over the past five years in terms of constant dollars. The funding of direct costs of sponsored research (mainly NIH research grants and contracts) at Jefferson was some 40% greater in 1974-1975 than that in 1971-1972, and has at least paralleled and perhaps slightly exceeded the increased costs of research. The number of funded research projects has held fairly steady the past three years. Members of the faculty in most departments have been diligent in preparing detailed proposals for research support.

University policies have been developed to maximize opportunities for faculty members to compete for extramural funding. The creation of physical facilities for research such as laboratory and office space and animal quarters and spec-
cialized equipment such as electron microscopes and computer terminals, are taken as institutional responsibilities, although the funding for equipment is often obtained via proposals initiated by individual members of the faculty. A recent example is the University's expenditures in support of research facilities for the Cardeza Foundation. The new facilities in the Curtis Clinic are a vast improvement over the old.

Currently, patient care activities are being moved out of the Curtis Clinic to provide additional space for the expansion of clinical departments and allow for increased research activities. Among the expanded facilities are those recently developed for the Departments of Surgery, Neurosurgery, Orthopaedic Surgery and Medicine. Others will be completed as funds become available. This expansion, coupled with the facilities available to the basic scientists in Jefferson Alumni Hall, will place Jefferson in the enviable position among medical schools of having adequate research space for both basic and clinical departmental research.

Productive scholarly activity is expected of each member of the faculty. Nowhere is this idea more clearly expressed than in the criteria for appointment and promotion of faculty members of Jefferson Medical College. Research accomplishment, as evidenced by scholarly publications, is required for promotion at all steps, with increasing productivity at each level.

A related policy is dictated by the necessity to replace our obsolete clinical facilities. At this time our resources are being severely taxed to accommodate the need for capital funds for the new Hospital. Although it is regrettable that we could not reach the ultimate goal of the Sesquicentennial Campaign within the two-year period the funds that have been collected make possible the freeing of some space for expanded clinical research by moving patients to the newly acquired Health Sciences Center at Ninth and Sansom Streets. Just as the availability of Jefferson Alumni Hall has made possible the acquisition and retention of research oriented basic scientists the completion of our renovation and building programs will enhance the potential for clinical research. Hopefully, budgetary limitations will not delay these renovations of the Curtis Clinic. Also the lack of a clinical research center is indeed a deficiency. However, the policy of maintaining fiscal stability requires that we cannot operate such a high cost facility in the absence of extramural funding. Rapidly rising costs including such items as fuel, electricity and wages of service personnel cause additional difficulties for researchers. These are troubled times for all institutions of higher learning especially those private universities conducting sizeable research programs. Inflationary pressures that impinge on all colleges and universities especially affect medical centers. The lack of intramural or University funds for new faculty members also is a limiting factor. Thus item two of the Board resolution is most heartening.

There has been an increasing emphasis on research in the basic sciences in the past few decades at Jefferson. Examples of research activities in these departments follow:

Anatomy: cytophysiology; comparative anatomy; comparative, experimental and reproductive endocrinology; neuroendocrinology; lipid metabolism; experimental embryology and teratology; fetal and perinatal anatomy; experimental neuroanatomy; tissue culture.

Biochemistry: immunochemistry (nature of antigen-antibody interaction; genetic control of immune response); enzymology; cell biology; metabolism of amino acids, carbohydrates, lipids, nucleic acids, and vitamin B-12.

Microbiology: microbial physiology and genetics; virology, mycology; parasitology; pathogenesis of infectious disease; immunology; and clinical microbiology.

Pathology: renal pathology; radiation pathology; cytotoxicology and ultrastructural studies of the nucleolus; regulation of cellular growth; use of enzymes to control tumor growth.

Pharmacology: toxicology (including biochemical toxicology); drug metabo-
eral effective vaccines against infectious disease. At today's hospital costs, for example, the nation saves $2 billion per year because of the vaccine against poliomyelitis. Equally large savings have resulted from chemotherapy for tuberculosis. Indeed it has been suggested that one dollar invested in research saves many dollars in subsequent medical care costs.

In the documentation provided to President Herbut, the University Advisory Committee on Research concluded by noting that a true university must rank disease categories should be limited and the cost benefits of medical research are dramatically. It is inappropriate to compare today's research expenditures with those of an earlier period in absolute dollar amounts. Government appropriations and authorization for biomedical research and training must take these factors into account; at a minimum, support for research and training should be established and sustained at a level that will bear some consistent relation to the nation's total expenditure for health.

Federal appropriations to promote research in specifically designated disease categories should be limited and made cautiously. Concentrating research funds in one disease area, such as cancer, may not be beneficial either to the total biomedical research effort or even to cancer research itself.

Funds should be specifically appropriated to train personnel in biomedical research. Without adequate numbers of personnel trained in both basic and applied biomedical research, new discoveries for the prevention and care of disease will be unlikely. Indentured service or financial or other penalties that encumber the use of research training funds by either institutional or individual awardees, are undesirable.

The American Medical Association will accept responsibility for informing the public on the relevance of basic and clinical research to the delivery of quality medical care. It is important that the public be familiar with the goals and methods of biomedical science so that the people and their representatives can effect sound scientific policy.

In closing I should like to urge that each member of the medical community keep in contact with our elected representatives and assure them that resources allocated for biomedical research represents a sound investment in the health of the American people.

### Historic Research and Modern Science


The initial work on which this study was based began in the year of Jefferson's founding. In that year, 1824, Frederick Wöhler, in Germany, first synthesized an "organic compound" (urea) from an "inorganic compound" (silver cyanate), and thus founded the science of Organic Chemistry, a cornerstone in modern biomedical research. Some 148 years later urea was tested as a possible therapeutic agent for the treatment of sickle cell anemia. It was noted subsequently that cyanate ions are present in aqueous solutions of urea, and that cyanate is an effective carbamylating agent; it reacts with the N-terminal amino acids of the β-chains of sickle cell hemoglobin and prevents aggregation, the cause of the devastating clinical picture. Sodium cyanate now is being tested clinically as a possible therapeutic agent, and the study conducted at the Cardeza Foundation is one of those concerned with determining its effects on enzyme systems in the red blood cell.

It is of interest that Wöhler's work of a century and a half ago was performed in his "teaching laboratory" in Göttingen, just as biomedical research is conducted today in the teaching laboratories of Thomas Jefferson University and other academic medical centers throughout the world.
TJU Research: Activity and Productivity

Jefferson scientists detail current projects in five representative research areas.
Using Polymers of Amino Acids to Study Genetic Control of the Immune Response

by Paul H. Maurer, Ph.D.

For the past 20 years or so we have employed synthetic polymers of amino acids as molecular models for proteins to study many parameters of the immune response. The synthetic polymers that have been used have contained one to three and sometimes four amino acids, either polymerized in random fashion or most recently as sequential polymers of amino acids wherein we know the exact sequences of the three to four amino acids repeated in the polymeric chain. The initial emphasis for this research was to study some of the parameters responsible for the property of immunogenicity, i.e. the ability of macromolecules which had the size of proteins, to elicit an immune response in many different species. Associated with this was the goal to develop a protein-like material that could serve as a synthetic plasma volume expander and not elicit immune responses. Although this goal was not reached, many other studies in our own laboratories, as well as in several others throughout the world, have yielded information about many of the molecular properties of macromolecules which contribute to the enhancement or the depression of immune responses.

During our studies with experimental animals it became obvious that one of the major components responsible for the ability of a host to respond immunologically was associated with the "genetic background of the individual." Since then many studies with random and inbred species such as mice, guinea pigs, rats and monkeys have indicated that the capacity to form specific immune responses is governed by the product of individual dominant (termed immune response [Ir]) genes located in the genome in close relationship with the genes coding for the molecules responsible for the histocompatibility specificities.

The major advantage of using synthetic polypeptides for immunological studies is that we have been able to present the host with a protein-like molecule having "limited structural heterogeneity." As is known, proteins are complicated molecules and a host can usually respond against many different areas on the macromolecule. However, by employing the synthetic polypeptides and measuring the immune responses by a variety of techniques it has been possible, in a relatively short time, to demonstrate that the responses to a wide variety of antigens are under the control of what is now called dominant histocompatibility-linked immune response genes. Because of the exceedingly complex nature of the immune response and the immune phenomena, this kind of finding was a surprise to us and other immunologists.

Before proceeding further, it is important to recognize that many of the studies are collaborative in nature. Although the earliest observations were made with the late Dr. Paul Pinchuck, who was associated with us at Jefferson for a short time, during the past seven years other faculty, such as Dr. Carmen F. Merryman and Dr. Allen R. Zeiger, and a number of postdoctoral and predoctoral students here at Jefferson have contributed greatly to the field. The collaborative efforts of many are necessary because of our multifaceted approach.

In order to understand the subsequent discussion, it is necessary to know a little about the present concept of the immune response. It is acknowledged that there is a considerable complexity in the cellular events associated with an antibody response to an antigen. The humoral (antibody) response must involve at least two, and probably three, cell populations; the B cell lymphocytes derived from the bone marrow, the T cell lymphocytes of thymus origin, and the macrophages. The B cell can manufacture antibody after it has come in appropriate contact with some determinants on the specific antigen. It is now well established that this event does not occur in isolation but is dependent on some kind of signal emitted only if there is a recognition of “carrier” determinants on the antigen by the T cell or a T cell product. While the role of the macrophage has not been clearly defined, it appears to be acting by acquiring a surface receptor from the T cell so that it combines antigen for presentation to the B cell. This has been referred to as the collaboration between these three cells, the T cell, the B cell and the macrophage, in eliciting an immune response.

Generally, in all of our studies we use several different parameters to measure the immune response. First and foremost, we measure the amount of specific antibody in the serum employing radioactively labelled antigens and some standard radioimmunoassay procedures. This humoral response measures the B cell function. However, depending upon the species being studied, we also measure other parameters of the immune response, such as the presence of sensitized T cells. In the guinea pig, we employ skin testing of the animal with the antigen and look for a delayed reaction as a measure of T cell response. However, in the mouse, rat and guinea pig studies we also isolate the T cells and measure the ability of the T cells to respond to tissue culture antigens as an indirect measure of the state of those T cells in the immunized animal.

As mentioned before, our initial findings with polymers of amino acids indicated that there must be some genetic component associated with the responses against the fairly simple "proteins." With a number of the polymers, such as those containing glutamic acid and lysine (GL), glutamic acid, alanine and tyrosine (GAT), glutamic acid, lysine and alanine (GLA) and glutamic acid, lysine and phenylalanine (GLP), as well as a number of the sequential polymers of amino acids, it is apparent that one can divide any population of a spe-
cies studied into "responders" and "nonresponders" to the specific immunogen.

One of our major goals is to learn why some animals are responders and others nonresponders. We also are interested in the nature of the receptors on T cells and on B cells responsible for the interaction with the antigen and in what kinds of molecular changes might occur during the interaction of antigen with antibody either in vitro or in vivo. Much of the in vitro research in the Department is conducted by Drs. Paul A. Liberti and Hugh J. Callahan who are studying how antibodies interact with antigens and what kinds of conformational changes might be occurring in the interacting molecules at the cellular level. The interacting molecules are responsible for the transmission of "signals" to the appropriate lymphoid cells to proliferate and to recognize more antigen.

Although not all of the questions about the immune response genes work have been answered, we, as well as many others, are clarifying some aspects of the genes' mechanism of action, and at the same time are uncovering many other unsolved problems in immunology.

Our earliest studies involved the randomly bred Hartley guinea pig. Although there were genetic clues, in order to prove more conclusively that there indeed was a genetic component associated with the immune response, we eventually had to use inbred strains of guinea pigs. However, there are available in the world only two highly inbred strains of guinea pigs, the strain 2 or the strain 13 guinea pig. The remarkable findings observed then and which are still being uncovered today with a number of our polymers is the tremendous difference in response patterns of these two inbred strains of guinea pigs against some of our polymers. For instance, the random polymers of glutamic acid and lysine (GL) and glutamic acid and alanine (GA) can elicit responses only in the inbred strain 2 guinea pigs. In contrast to this, the polymer of glutamic acid and tyrosine (GT) can elicit responses only in the strain 13 guinea pigs. The exquisite sensitivity of the animal's recognition mechanism to subtle changes in structure of a polymer has been shown in our laboratory with the sequential polymers synthesized by Dr. Allen R. Zeiger. A polymer having the repeating sequence of tyrosine, glutamic acid, alanine and glycine elicits responses only in the strain 13 guinea pig, whereas the polymer of tyrosine, alanine, glutamic acid and glycine elicits responses only in the strain 2 guinea pig.

Since these early studies with guinea pigs, we and other international investigators have contributed information which indicates that there must be at least 30-40 immune response genes controlling responses in the mouse, guinea pig, rat, monkey and man. These genes are dominant and they determine both the cellular and humoral immune responses.

In studying the immune response patterns of inbred mice against a number of the polymers, however, we made the remarkable observation that the responses were not only under genetic control, but they also were linked to another group of antigens, the complex of histocompatibility antigens. These histocompatibility antigens are located on the surfaces of cells and although their normal functions are unknown, it is known that they are the antigens most responsible for the rejection of transplanted organs. The major initial advantage of using the mouse in studying the immune responses was the availability of many different strains. The development of these many highly inbred strains took place because of the growth of another branch of immunology dealing with elucidation of the mechanisms of the graft vs. host phenomena (transplantation immunology). It was shown that in every species there are important histocompatibility genes and gene
products, known as the antigens, which are the basis for immunological individu-ality and determine whether an individual will reject a graft as foreign. During the past ten years, based upon the chance observation made initially by Dr. McDevitt of Stanford, we have learned not only that the immune response is under genetic control, but that the ability to respond or not to respond is linked to the nature of the major histocompatibility complex of the mouse. This also has proven the case in studies using many other species. The concept of genetic linkage means that the genes, such as those governing immune responses and those responsible for the expression of histocompatibility antigens, are transmitted together from parent to progeny; therefore both of these genes are likely to be close together on the same chromosome. Employing what are now the tools of a new area in immunology, immunogenetics, we have been able to "map" the area in the chromosome responsible for the recognition of the antigen. The mouse has truly been the most rewarding species for the study of these histocompatibility-linked immune response genes both because of the number of inbred strains developed by the students of tissue transplantation, and because we have available specific lines of mice which have slight differences in this histocompatibility complex (H-2). By studying the response patterns of many similar mice it has been possible to determine the chromosomal segment in the gene complex responsible for these responses, which immunologists have termed the 'T region'.

In an area of research which moves as rapidly as the fields of immunology, immunochemistry and immunogenetics, surprise findings are occurring all the time, that suggest future research.

We were puzzled, for instance, when our observations in determining the location on the mouse chromosome of the gene controlling the response against the polymer of glutamic acid, lysine and phenylalanine were incompatible with our previous findings and those of others studying a similar system. Upon further investigation it became apparent that with this polymer the responses were controlled by at least two genes acting in a complementary fashion rather than by a single gene. In other words, it appears that two genes are needed to control responses (multigenic control) against some of the polymers, a finding that has been corroborated with different kinds of polymers by several laboratories throughout the world.

From our research it has become clear that the responses specified by these immune response genes involve the activities of the T lymphocytes. As indicated before, there are two major classes of lymphocytes which participate in the immune responses. The B cells are the precursors of the antibody secreting cells and are responsible for humoral immunity. The T cells are the effectors of cellular immunity and may act directly to destroy foreign antigens including transplanted organs. They also regulate antibody production either by helping or suppressing B cell activities. It therefore appears that the immune response genes to which we have been referring are expressed mainly on the T lymphocytes and actually may be involved with the receptors for the antigen. In other words, one of the important mechanisms we know today is that the T cells which recognize antigen help the B cell produce the humoral immune response.

The explanation that we and others had offered a number of years ago (to explain responsiveness and nonresponsiveness) was that the inability to respond against a specific immunogen was related to a defect in the T cell recognition of the antigen. That is, nonresponders were lacking T cells that could help the B cells. However, a few years ago in collaboration with Dr. Richard Gershon of Yale University we were able to show that the nonresponding animals could also "recognize" the antigen even at the T cell level, but that this recognition involved interaction with another class of cells now termed suppressor T cells. It is now apparent that associated with the complexity of the immune system is the importance not just of T cells, but of different kinds of T cells—those that can help the B cell, those that can suppress the B cell.

An important part of our studies is therefore to separate the various populations of lymphoid cells within an animal for in vitro tissue culture studies. Dr. David J. Ganfield in our research group is attempting to fractionate lymphoid cells and isolate the T cells from an immunized animal and employ them in tissue culture techniques to determine the responses of the T cells to challenge with antigen. We and others have demonstrated that responder T cells can recognize the antigen in vitro, proliferate and eventually characterize the nature of this receptor.

Although there is little controversy about the nature of the recognition molecules for antigens (receptors) on the B cell (they are antibody molecules), the question of the identity of the receptors for the antigen on T cell is in considerable dispute. Some investigators believe that the T cells have receptors consisting of the immunoglobulin (antibody) molecules, and others can find no evidence for their presence. We are involved in a great effort to isolate from the surfaces of T cells macromolecules which might be responsible for the in vivo recognition of the antigen. This is literally more difficult than looking for a needle in a haystack; even after one finds the needle, one must determine whether this needle (receptor) has come from the T cells or from some other lymphoid cell.

Although almost all of our research can be considered basic and has involved laboratory animals, there are important implications of our research which may contribute to a better understanding of human diseases. Although we have found that the responses against a number of antigens are controlled by genes which are closely linked with the major histocompatibility complex in a number of species, the all important question is: "Does this have any relevance to man?" First of all, in animals, associations have been shown between the nature of H antigens and diseases such as autoimmune myelitis in mice, the susceptibility of rats to experimental allergic encephalomyelitis, and the susceptibility of mice to the pathogenic effects of lymphocytic choriomeningitis virus. What about man? A number of investigators have been showing associations between a
number of human diseases and the specific histocompatibility antigens of man (HLA). Most of the diseases are associated with defective or aberrant immune responses and many are thought to be of "autoimmune origin," i.e. they may be caused by an immune system attack on the body's own tissues. They include ankylosing spondylitis, Reiter's disease, psoriasis, Graves' disease, multiple sclerosis and ragweed fever. In addition, there appears to be an important role for these histocompatibility linked Ir genes in the development of tumor immunity and tumor rejection, not only in experimental animals but possibly also in man. It is known that malignant neoplasms bear distinct and new tumor specific surface antigens which are responsible for the stimulation of tumor immunity. The immune responses to tumor specific antigens are recognized as being very complex, involving cellular immunity, cytotoxic and blocking antibodies and the possible involvement of the class of T cells we referred to before as suppressor cells. In fact, for reasons unrelated to the study of tumor immunity per se, it has been shown that there are genetic factors controlling the susceptibility to Gross virus leukemia in inbred mouse strains and that even in the mouse these genes are closely linked to the mouse H-2 genotype. Similarly, in mice, the susceptibility to Friend virus leukemia is also linked to the H-2 complex.

Observations of this kind have led to another collaborative study with Dr. Dan Moore of the Institute for Medical Research in Camden, who has been studying the transmission of the breast cancer virus from mother to offspring via the milk in inbred strains of mice. Dr. Merryman and I are now involved with Dr. Moore in investigating the possible role of the H-2 complex of the mouse in determining resistance or susceptibility of a mouse strain to murine breast cancer. Again, the implications in human breast cancer are great.

The possible relationship between tumor susceptibility and HLA genotype might be explained by the absence or presence of the appropriate immune response genes in a susceptible individual which could render the person incapable of developing an adequate immune response against the tumor specific antigen. In fact, the immune system, which is a unique immune surveillance machinery, is believed to be important in removing tumor cells.

What started about 25 years ago as a study associated with an applied problem, the development of a synthetic plasma expander, has moved through a number of basic studies and revealed many of the parameters of immunogenicity. By understanding the role of genes in controlling immune responses, we hope it will be possible to apply these findings to the enhancement or depression of the immune response, depending upon the specific problem at hand, i.e., to enhance the response to cancer antigens and to reduce the response to transplantation antigens.

The Stein Research Center houses clinical research and teaching programs of the Departments of Radiology and Radiation Therapy. At present, there are three major activities housed at the center: 1) the Medical Physics Division of the Radiology Departments; 2) a portion of the Radiation Biology section of the Department of Radiation Therapy and Nuclear Medicine and; 3) the Radiation Biology and Developmental Biology programs of the Radiation Biology section of the Department of Radiology. Actually three-quarters of the space and personnel are devoted to programs in developmental biology and radiation embryology, and since I am intimately involved in these programs, I shall concentrate on these activities.

The goals of the faculty and research staff members are multifaceted. We have always encouraged medical student participation in our research programs even when a student indicated he just wanted a "taste" of research. It is just as important for a medical student to know that he is not suited for an investigative career as it is to know that he wishes to devote the remainder of his life to creative research. Predoctoral candidates from the Departments of Anatomy, Physiology, Biochemistry and Pharmacology have conducted their investigative programs at the Stein Research Center as part of the requirement for the Doctor of Philosophy degree. Postdoctoral candidates from diverse fields such as pediatrics, obstetrics and gynecology, endocrinology, pharmacology, anatomy, medical physics and biomedical engineering have trained here.

The development of a research philosophy and the establishment of undergraduate and graduate research programs cannot be undertaken and cannot be characterized as quality programs without the presence of ongoing research programs conducted by the permanent staff at the Stein Center or any research center.

The developmental biology and radi-
Radiation biology programs are supported by outside governmental agencies and non-profit foundations. Research support for present and past programs has been obtained from The National Foundation*, The Royal Society of Medicine, The National Institute of Child Health*, The Fogarty International Center, The Atomic Energy Commission, The Energy Resource and Development Agency*, The National Institute of Environmental Health Science* and Smith, Kline and French Laboratories.

Although the developmental biology programs can be considered modest, the total budget from outside agencies since I came to Jefferson amounts to more than three million dollars. Besides the research funding, the developmental biology programs at the Stein Center receive other support. Without some faculty support from the Jefferson Medical College the Stein Center could never have been developed. The generous gift of Mr. and Mrs. Louis Stein, the Eleanor Roosevelt Foundation and the NIH permitted the structure to be built. Dr. Philip J. Hodes, Emeritus Professor of Radiology, spent much of his time and energy in conceiving and working for the creation of a Radiology Department research institute. Ongoing unrestricted support has come from a group of dedicated donors such as the Harry Bock Charities and the League of the Harry Bock Charities. These groups have worked tirelessly to support the program at the Stein Center and, in fact, the developmental biochemistry laboratories on the second floor are known as the Harry Bock Laboratories.

The research programs of the developmental biology groups include problems in radiation embryology, fetal physiology, placental transport developmental immunology, embryo culture, effects of microwave radiation, fetal endocrinology, teratology and legal medicine.

Studies in radiation embryology have been conducted continuously at Jefferson since 1957. The results of these studies have clarified the quantitative aspects of the effects of radiation on the developing mammalian embryo. Some important concepts that have developed from this research include:

1) Embryonic and fetal growth retardation are intimately associated with malformations produced by radiation.
2) The embryo, while very sensitive to radiation, also has sophisticated repair mechanisms which can prevent the effects of radiation if the dose rate and dose are very low.
3) The preimplantation period of mammalian development is a stage that is resistant to the teratogenic and growth retarding effects of radiation.
4) X-ray exposures below ten rads have no ability to produce gross malformations in this mammalian embryo.

These and other radiation studies have permitted the staff to become quite sophisticated in the evaluation of human radiation hazards to the pregnant woman. As a result, our laboratory is a center for the evaluation of radiation effects in exposed potentially pregnant or pregnant women. We receive approximately 100 calls each year from all over the United States pertaining to such radiation hazards. Besides calls about radiation hazards we receive requests for information about drug and chemical hazards during pregnancy.

Developmental immunology research has been conducted by Marcela Jensen, Dr. Christopher C. K. Leung, Dr. Thomas R. Koszalka and Dr. Ronald P. Jensh for many years. In 1961 we first reported the production of congenital malformations by injecting heterologous anti-rat kidney antiserum into pregnant rats. This was the first report that a specific immunoglobulin could be a potent teratogen. While other investigators had reported congenital malformations following exposure to foreign antibodies, none of the findings was corroborated. This discovery led to the realization that the teratogenic antiserum was localized in the yolk sac. Dr. Koszalka, Dr. Jensh, Dr. Leung and Ms.

*Presently supporting research or educational programs in developmental biology and radiation biology.
Jensen have begun extensive investigations dealing with yolk sac function, placental transport, collagen synthesis in the developing yolk sac and are attempting to isolate yolk sac and kidney antigens. Since the human has a vestigial yolk sac when compared to the rodent, this line of investigation has raised an interesting question. If the yolk sac is a critical organ in rat teratogenesis, are rats or other rodents appropriate species to utilize for screening drugs and chemicals for potential human teratogenesis?

Dr. Koszalka, who is Professor of Radiology and Biochemistry and Director of the Developmental Biochemistry Laboratories, works with all members of the developmental biology staff and is involved in his own program of placental transport and muscle biochemistry. He has continued with his studies dealing with the mechanism of creatinuria following X-irradiation and the fact that insulin can reverse the creatinuria of radiation injury. His expertise in creatine metabolism has permitted us to study normal and abnormal transport in placenta and the transport of agents which result in transplacental carcinogenesis.

Dr. Jench, who is Associate Professor of Anatomy and Radiology, was the first Ph.D. graduate supported by the developmental biology program and has maintained his interest in teratology and developmental biology. In 1970 our laboratory reported that high exposure microwave radiation could cause interruption of pregnancy. Because of expertise in this area, Dr. Jench received a grant from the National Institute of Environmental Health Service to study the effects of microwave radiation on the developing embryo. Dr. Wolfgang Vogel is an intimate partner in the area of animal psychological testing. Mr. Irvin Weinberg, a biomedical engineer, has designed the anechoic chamber and microwave equipment for the project (see cover).

Other contributions of the developmental biology program include:
1) The production of congenital malformations utilizing the technique of uterine vascular clamping;
2) The report that the individual embryo was frequently an erroneous sample in teratologic testing;
3) The preparation, at government request, of a soon-to-be released monograph entitled, "The Prevention of Embryonic Fetal and Perinatal Disease;"
4) The refocus of embryonic nutrition as an important area for developmental biologists for the next decade;
5) The analysis of the basis of malpractice litigation involving congenital malformations and the development of a national plan to decrease malpractice litigation;
6) The training of developmental biologists who have gone on to head their own programs at other major medical centers;
7) The attraction of other developmental biologists to Jefferson. I would like to elaborate on the last point. Dr. E. Marshall Johnson is Chairman of the Anatomy department and is well-known in the field of teratology. He has been a long-term colleague of mine. With his coming to Jefferson in 1972 and the creation of a solid contingent of developmental biologists in the Department of Anatomy, the Medical College now has one of the strongest multidisciplinary programs in developmental biology in the country. Furthermore, the program is now attracting the interest of other faculty members and there is an excellent possibility that research programs will be initiated that will cross departmental lines and be able to answer the multitude of questions that pertain to the mysteries of embryonic development. For those who may consider basic embryology and teratology to be esoteric and far from clinical medicine, let me point out that congenital malformations, mental retardation and genetics contribute an inordinate burden to mankind. The cost of custodial care for children and adults with prenatal disease is staggering. The recent advances in genetic counseling, cytogenetics, transplacental carcinogenesis, amniocentesis and perinatal care make our efforts in the developmental biology laboratory even more meaningful. Twenty years ago no one could have imagined that there would be so many clinical advances in the field of applied developmental biology, which is just another name for pediatrics and obstetrics and gynecology.

(right) Home: These enclosures of Dr. Brent's contrivance are fitted at the top with inexpensive lab bottles, allowing their experimental rat inhabitants a ready and clean source of water. (far right) Technicians in Dr. Wheelock's lab remove mice spleens. Transfer of spleen cells from FLV infected mice in large numbers to normal mice produces FLV erythroleukemia.
Understanding the Tumor Dormant State

by E. Frederick Wheelock, M.D., Ph.D.

Current treatment of human cancer consists of surgery, chemotherapy, X-irradiation, immunotherapy or combinations thereof. A common measure of successful treatment is five-year survival without recurrence of tumor. All too often, however, tumor cells reappear even after prolonged clinical remission. Such tumor cells have, by some as yet unknown mechanism, escaped destruction during the remission period despite being held in check. To date, few if any studies have directly addressed themselves to this question of tumor dormancy. This is surprising, since it is the inability to eradicate residual tumor cells completely that often thwarts our best attempts to achieve a cancer cure. The present lack of knowledge with respect to the forces involved in maintaining and breaking tumor dormancy hinders our ability to do more during this crucial period.

The principal objective of the research conducted in my laboratory has been to understand this relationship between host and dormant tumor cells and manipulate it in favor of the host. We have developed two major experimental animal model systems, one a virus induced leukemia of mice and the other a chemically induced transplantable lymphoma of mice. These experimental models are highly manipulatable and will permit an analysis of the tumor-dormant state.

Friend Leukemia Virus

Friend leukemia virus (FLV) is one of a number of antigenically related leukemia viruses of mice. Infection of adult inbred mice with this virus produces erythroleukemia in 100% of mice characterized by hepatosplenomegaly and large numbers of erythroblasts in the circulation within 21 days. All leukemic mice are dead within ten weeks after infection. FLV infects many cell types in the host, including lymphocytes, and infection leads to a rapid suppression of both humoral and cellular immunity. Reasoning that the immunodepression induced by FLV might be essential for its leukemogenicity, we sought ways to restore immune competence to FLV infected mice and thereby permit the host to mount an immune response to the virus.

We found that 100% of DBA/2 mice were viremic and had large numbers of leukemic cells in their spleens by the third day after virus inoculation. An extensive search was made for a drug or other biologic agent that could suppress FLV erythroleukemia when administered three days after FLV inoculation. Such an agent was found in an extract of virus infected Penicillium stoloniferum fungal cultures. This extract, called statolon, could, when combined with another adjuvant, COAM (chlorite oxidized oxyanlyl) suppress erythroleukemia in 90% of FV infected mice. We found that COAM-statolon treatment results in interferon production and a transient suppression of FLV replication. Virus is cleared from the blood and the mice produce an antibody which neutralizes the virus and kills leukemic cells, in vitro. Statolon treated mice suppress their FLV infection and are clinically normal displaying no gross pathologic, clinical, or hematologic manifestations of leukemia for their entire two-year lifespan. However, FLV emerges spontaneously late in life in some of the mice to produce characteristic erythroleukemia indicating that the virus was present in a dormant state during the prolonged clinical remission. Attempts to isolate infective FLV from the blood or spleen of these mice during remission have been unsuccessful. However, transfer of their spleen cells in large numbers to normal mice produces FLV erythroleukemia indicating that the virus and/or leukemic cells were present in the clinically normal mice.

The persistence of FLV infected spleen cells in clinically normal mice for many months could be explained by two possible mechanisms.

1) Large numbers of spleen cells are infected and contain the genetic information for FLV integrated into their cellular DNA. Random reactivation of the virus may occur in dormantly infected cells resulting in virus replication and production of new virus-induced antigens on the surface of transformed cells. Friend virus cytotoxic antibody present in the extracellular fluid at sufficient levels recognizes these foreign viral antigens and destroys the transformed cells as they are formed. However, as mice age, antibody levels decline and FLV transformed cells break through to produce overt leukemia.

Dr. Wheelock is Professor of Microbiology.
Dr. E. Frederick Wheelock: The objective is to manipulate the host-dormant tumor cell relationship in favor of the host.

There is, however, one flaw in this hypothetical mechanism. The FV-specific antibody requires complement to kill cells. In our in vitro assay we add guinea pig complement. However in vitro the antibody cannot kill leukemic cells since the DBA/2 mouse is deficient in complement components essential for antibody mediated immune cytolysis. What then is the function of this antibody in the animal itself? Is it in some way involved in suppression of uncontrolled leukemia cell division and establishment of the dormant state? The answer may be found in the phenomenon known as antigenic modulation, first reported in 1963 by T. Boyse and L. Old and subsequently demonstrated in a number of immunologic systems. Antigenic modulation is a phenomenon in which phenotypic expression of antigen at the cell surface is modulated by the presence of specific antibody in the extracellular fluid. Old made the unexpected observation that mice immunized and containing complement and antibody against cell surface leukemic antigens were not resistant to outgrowth by those leukemic cells. The mechanism of escape of the leukemic cells from the immune response was investigated. Old found that leukemic cells existing in the presence of leukemia specific antibody lost their leukemia specific cell surface antigen so that the cells were no longer susceptible to attack by specific antibody. Removal of these modulated leukemic cells to a non-antibody containing environment resulted in reappearance of the leukemia-specific surface antigen.

This phenomenon has recently been implicated in several human diseases. In subacute sclerosing panencephalitis, this mechanism may account for the escape of measles virus-infected cells from the high titered virus-specific antibody present in the blood for many years. Modulation of cell surface measles virus antigen by virus-specific antibody has been demonstrated in vitro and may account for virus persistance in this dis-ease. It has also been implicated in Burkitt lymphoma.

Because of the complement deficiency in DBA/2 mice, we have developed a second hypothesis for the dormant FLV model.

2) This hypothesis states that the interaction of virus-specific antibody with newly made virus antigen at the cell membrane results in inhibition (antigenic modulation) of the virus genome. Dormant FLV infected cells may persist with activation occurring at random and viral cell surface antigens being expressed and modulated until late in life when antibody levels decline. At this point, emergence of leukemia occurs.

One of our graduate students, Eugene Genovesi, has in the past year demonstrated antigenic modulation in the Friend virus system in vitro. Dr. Preston A. Marx, Assistant Professor of Microbiology and Rosemary Marano, graduate student, are analyzing the FLV specific proteins on the surface of leukemic cells in order to identify the proteins to which a modulating humoral antibody response is directed. Characterization of the antibody which specifically suppresses the FLV infection and development of ways to stimulate production of this antibody to prevent emergence of leukemia are major goals of this laboratory. Another graduate student, Julia Wirth, is studying the host cellular immune mechanisms involved in leukemia suppression and maintenance of dormant leukemia.

L5178Y Transplantable Murine Lymphomas

The second experimental model that we are studying consists of a chemically induced lymphoma of DBA/2 origin. This tumor, designated L5178Y, can consistently grow out and kill DBA/2 mice following intraperitoneal implantation of as few as 20 viable tumor cells. Its suitability for study as a model for tumor dormancy is based principally on the finding that DBA/2 mice that have been immunized with mitomycin C-treated L5178Y cells routinely resist tumor challenges that kill 100% of non-immunized mice in less than 25 days.
However, extended observations of these immunized and challenged mice revealed that about 40% of them developed and succumbed to ascitic tumors within 18 months. The development of ascitic tumors in normal aged DBA/2 mice has never been observed.

Dr. Lester Goldstein, post-doctoral Fellow, and Kent Weinhold, graduate student, have been studying the mechanisms of tumor dormancy in this system. One of our experimental approaches has been to isolate tumor cells from mice while they are in the prolonged clinically normal state. We have succeeded in doing so by placing cells from various organs of these mice into cell cultures in vitro and have observed outgrowth of tumor cells. Our current efforts consist of attempts to reconstruct in the cell culture system the immune and non-immune components of the dormant tumor mouse. Our aim is to understand why tumor cells remain dormant in vitro but grow out rapidly in vitro. By adding selected lymphoid cell populations and macrophages and soluble serum factors from tumor dormant mice to the culture system together with tumor cells, we hope to identify those factors or combination of factors that maintain the tumor cells in a dormant state in vitro. We do know that these tumor dormant mice contain an antibody that binds to but does not destroy tumor cells. We believe that maintenance of the tumor dormant state may involve the loss of exposed cell surface targets for host immune mechanisms. The most likely explanation for such loss is antigenic modulation. It is also possible that some surface receptors responsible for regulation of cell division are usually concealed during tumor progression. These receptors may become unmasked during antigenic modulation and lead to the regaining of control of cell division by the host. It is also possible that tumor dormancy could be the result of the action of cytostatic rather than cytolitic host mechanisms. Walter Carney, graduate student, is studying this aspect of the problem using L5178Y cells in DBA/2 × C57/B6-F1 hybrids.

Implicit in this line of research is the hypothesis that modulation of both the FLV leukemic cells and the L5178Y lymphoma cells results in reestablishment of normal cell division. The tumor cells can, however, survive attacks from immune cells and antibody since they no longer have tumor specific target antigens on their surfaces. In contrast with other tumor systems, in which antigenic modulation is viewed as a mechanism of tumor cell escape from attack by the immune system, we believe that antigenic modulation can lead to tumor dormancy. The animal model system which we are studying in our laboratory will enable us to characterize the host tumor interactions that lead to the establishment of the dormant tumor state and the events that subsequently occur to break this dormancy and permit tumor emergence. An understanding of the interaction involved in tumor dormancy and emergence would greatly facilitate the development of methods of prolonging the tumor dormant period and eradicating all residual tumor cells.

Beginning in July 1974 with the arrival of several new staff members in the Department of Physiology, cardiovascular physiology became a major focus of research on cardiovascular function in health and disease states. These new staff members, who are well trained in this area and have established laboratory programs, are Dr. Michael J. Rovetto and Dr. James A. Spath, Jr., Assistant Professors. My own appointment as Professor and Chairman of the Department was effective that July. Each has developed projects which involve utilizing expertise and techniques in several areas.

Following is a brief description of the type of research work conducted in each laboratory, the professional researchers leading each project, and the basic questions being asked by these investigative teams.

**Circulatory Shock Research**

Research in this laboratory centers around pathophysiology and therapeutics of circulatory shock with particular emphasis on the mechanisms of elaboration of toxic factors during hemorrhagic, septic, cardiogenic, bowel ischemia, acute pancreatitis, and burn shock. Efforts are being devoted to elucidation of the chemical structure of the toxic peptide Myocardial Depressant Factor (MDF), and of the key roles of lysosomal hydrolases, prostaglandins and kinins in cardiovascular alterations during shock and low flow states. Studies are also concerned with protease activation and proteolysis in the pancreas and liver during ischemia and other conditions simulating shock.

Additional studies are concerned with pathophysiological mechanisms of development of myocardial infarction. The subcellular mechanisms of the spread of ischemic damage during acute myocardial infarction are being investigated. Pharmacologic studies also are underway in an effort to determine which agents are useful in the preservation of myocardial integrity during myocardial ischemia.

*Dr. Lefer is Professor of Physiology and Chairman of the Department.*
Dr. Allan M. Lefer: Since 1974 cardiovascular physiology has been a major focus of research on cardiovascular function in health and disease states.

One of the recent breakthroughs in shock research has been the elucidation of the role of shock factors, particularly MDF, in the pathophysiology of shock. Current activities thus include a systematic effort to determine the mechanisms of formation and the amino acid sequence of this peptide. The work is microchemical in nature as MDF concentration in the plasma of animals and patients in shock is in the range of one nanogram/ml and this involves the cooperation of protein chemists at other institutions, both in the United States and abroad. The work is coordinated in Philadelphia by Frances Kuber, a research technician specializing in analytical chemical techniques, and me.

One of the new areas of research in this laboratory concerns the role of the prostaglandins in circulatory shock. Dr. John T. Flynn, Research Associate, and Mr. G. Alan Bridenbaugh, predoctoral Fellow, are working with me in this area. Part of the work is directed toward the quantification of the synthesis and release of the major prostaglandins (e.g., PGE₂, PGE₃, PGF₆α) in different types of shock (e.g., hemorrhagic, bowel ischemic, cardiogenic). These experiments involve the use of pharmacologic agents to block prostaglandin synthetase, the enzyme largely responsible for prostaglandin synthesis by means of appropriate drugs (e.g., indomethacin, meclofenamate) to determine the effects occurring in the absence of released prostaglandins. Other experiments involve the infusion of arachidonic acid, the precursor of the bisenoic prostaglandins (i.e., PGE₂, PGF₆α) to determine the effects of increased circulating prostaglandin levels. In addition, the effects of exogenously administered prostaglandins are being studied in intact animals as well as in isolated organs (e.g., isolated perfused hearts and aortic strips). When the results of these studies are integrated, it is anticipated that it will be possible to ascertain whether prostaglandins are mediators of the shock state or whether they induce compensatory actions beneficial to the survival of the animal or patient in shock.

The role of platelets in circulatory shock is being investigated by determining the effects of toxic factors such as MDF and lysosomal hydrolases on the aggregability of platelets by use of a recording aggregometer. Studies are also in progress to determine the role of platelets in obstructing the splanchnic microcirculation during shock and to determine the effect of removing platelets prior to induction of shock on the development of the shock state. These thrombocytopenic animals represent an interesting model in which to evaluate the pathophysiologic mechanisms of shock.

One area of great concern is the functional status of the liver in shock. Richard Carlson, Research Associate, and Genevieve Deutch, a research technician specializing in metabolic methods, are working in my group on this timely problem. They are studying liver performance in a multiplicity of ways. In addition to studying liver metabolisms (i.e., glucose metabolism), considerable emphasis is being placed on hepatic integrity (i.e., both parenchymal and Kupffer cells) and on reticuloendothelial function (the latter by measurement of clearance of colloidal suspensions of par-
The effects of exogenously administered prostaglandins are being studied in intact animals as well as in isolated organs such as aortic strips.

particles of known size). Although some of the responses of the liver to circulatory shock are studied in the intact animal, many of the key experiments are conducted in the isolated perfused cat liver. This preparation allows the study of the effects on liver integrity and function of ischemia, hypoxia and acidosis. If a clear picture of the response of the liver to shock can be determined, therapeutic regimens to normalize the pathophysiologic changes can be designed. Some of the findings were recently presented by me at an international congress of emergency care medicine in Rio de Janeiro.

The other major area of interest in my laboratory is the pathophysiology and therapeutics of acute myocardial infarction. Two of the major questions being asked are: (1) What are the early events occurring in myocardial cells after the onset of acute ischemia? and (2) How can we preserve myocardial cell integrity after ischemia, and prevent either cardiac failure or cardiogenic shock?

A recent breakthrough in this area has been the realization that the ultimate size of the developing myocardial infarct is not fixed or predetermined at the onset, but can be modified with appropriate drug therapy. Recently, it was found that synthetic glucocorticoids are very effective in preventing the extension of infarct size. Tentative results indicate that the mechanism of this protective effect is stabilization of myocardial cell membranes (i.e., plasma and lysosomal membranes).

Present studies underway with Dr. Minoru Okuda, Research Associate on leave from Defense Medical College in Japan, focus on the mechanisms of myocardial cell uptake of glucocorticoids using isotopically labelled glucocorticosteroids. He is being assisted by Mr. George Osman, a research technician who is a specialist in isolated cardiac and vascular preparations. Work in this area involves the use of cardiac tissue slices, isolated perfused hearts, and intact animals. These studies indicate that myocardial tissue passively takes up large amounts of glucocorticoid. Using cell fractionation techniques (i.e., density gradient separation coupled with ultracentrifugation), most of the uptake was found to be in the plasma and lysosomal membrane fractions.

Clinical studies are also underway with Dr. Leslie Wiener, Professor of Medicine and Director of the Coronary Care Unit, to determine the efficacy of glucocorticoid therapy during myocardial infarction in clinical settings. This study exemplifies the application of physiologic investigation to future patient care.

Other important work in progress in the area of pathophysiology of myocardial infarction is devoted to determining the early cellular and sub-cellular events in acute myocardial ischemia. These studies are in progress with the help of Mr. Martin Ogletree, predoctoral Fellow, and Dr. Mario Feola, Assistant Professor of Surgery. This group has developed a technique for sampling regional myocardial tissue and the coronary venous effluent from ischemic areas. Thus, tissue and blood samples can be studied for the release of lysosomal enzymes and prostaglandins, two markers for early cellular damage to the myocardium. Outgrowths of this work involve the effect of anti-inflammatory agents in the infarction process. These approaches have been very fruitful in the past two years, and are of great potential in unraveling the mechanisms of control of cardiac performance in ischemic states.

Myocardial Metabolism and Myocardial Ischemia

The research programs in this laboratory are concerned with the way in which the metabolism of the myocardium is controlled and can be modified
by hormones and other agents. This also involves studying the relationship of altered states of metabolism to the mechanical function of the myocardium. A major interest is the effect of ischemia, or reduced blood flow, on purine, carbohydrate and fatty acid metabolism. Agents are being studied which may protect the myocardium from permanent damage during ischemia by preserving or increasing the metabolic capacity of the heart.

A variety of experimental techniques are used in these studies. Much of the research employs an isolated, perfused, working-heart preparation which allows the variables that influence mechanical function and metabolism to be closely controlled. Intact animal preparations are also used in studies designed to test potential therapeutic agents. These preparations are coupled with many analytic biochemical techniques which include spectrophotometric and fluorometric enzyme assays, radioactive tracer techniques for determining utilization rates of substrates, and chromatographic techniques for separation of metabolites and intermediates of interest. These and other related techniques are used to determine the rate-limiting steps in metabolic pathways and the factors which control these pathways.

Dr. Rovetto is assisted in this work by Diane Reibel, predoctoral Fellow, and Diane Ubele, a research assistant who specializes in isotopic biochemical methods. This group has recently been able to separate the effects of hypoxia and ischemia on myocardial metabolism. Surprisingly, hypoxia appears to lead to an increase and ischemia, a decrease in the rate of anaerobic energy production. These differences in the rate of energy production are due to accumulation of metabolic products resulting from the low blood flow during ischemia. The studies are of fundamental importance for the understanding of the response of the heart to preinfarct stress states. They also point out the role of myocardial intracellular hydrogen ions and other metabolic products as key factors in the control of myocardial metabolism. These studies have prompted Dr. Rovetto to investigate the influence of these metabolic mechanisms on the coronary vasculature, a long neglected aspect of the total control system.

Recently, Dr. Rovetto has teamed up with Dr. Feola, of the Department of Surgery, Dr. Wiener, of the Department of Medicine, and Dr. Raymond Soriano, of the Department of Pathology, to study cardiac edema in myocardial ischemia. Using electron microscopy with special lanthanum staining techniques, this fruitful collaborative study has shown that edema is a real phenomenon in acute myocardial ischemia. Moreover, this team has gone one step further and showed that pharmacologic doses of glucocorticoids are beneficial in limiting the edema, reducing the severity of cellular injury and stabilizing myocardial cell membranes.

Dr. Rovetto is also engaged in relating the hormonal control systems to the regulation of cardiac function and metabolism. In this area, he is currently investigating possible direct effects of thyroxine and long term stress, which elevates a number of hormones, on various energy producing processes in the heart. These studies are primarily concerned with trying to determine what limits the rate of energy production within a given pathway, how these rates might be changed by hormonal mechanisms and the relationship between the hormonally-induced changes in energy production and myocardial mechanical function. Understanding of these processes and relationships will prove valuable for developing interventions to protect the energy deficient myocardium both during ischemia and failure.

**Hemodynamics and Low Flow States**

The research activities in this laboratory involve studies of (1) pharmacologic mechanisms of maintaining cellular integrity within the heart tissue in states of low blood flow (2) the pathophysiology of cardiogenic shock and other low flow states and (3) factors or mechanisms which regulate blood flow within the organs of the body.

Research projects are designed to investigate normal and pathological mechanisms which may operate within the circulatory system. The aim of each study is to relate physiologic activities of the total organ or organism to underlying activity at the cellular level.

Dr. Spath has designed some special techniques in order to achieve these goals. Recently, in this laboratory, a new technique for studying pericardial tamponade and sampling myocardial tissue and pericardial fluid was developed in order to study the development of cardiogenic shock induced by pericardial tamponade. Assisting Dr. Spath in these studies are Patricia Gwirtz, predoctoral Fellow, and Ernest Rivers, American Foundation for Negro Affairs student.

Dr. Spath is also actively engaged in studying the role of lysosomal hydrolases in the pathophysiology of acute myocardial infarction and in the transition from myocardial ischemia to cardiogenic shock. These studies have yielded fundamental insight into the cellular aspects of ischemic damage and have called attention to the role of acid hydrolases in propagating the spread of ischemic damage from cell to cell after the initial ischemic insult. In this connection, lysosomal proteases appear to be particularly important in mediating cellular disruption and ischemic damage. A certain protease inhibitor has been administered in experimental myocardial ischemia and found to be effective in preventing the spread of ischemic damage in the heart. This agent, aprotinin, is being studied further for additional information on its mechanism of action.

In an attempt to interrelate myocardial ischemia with pulmonary dysfunction, Dr. Spath is currently working with Dr. Marlys Gee, Assistant Professor of Physiology, on pulmonary edema in acute myocardial ischemia. By the use of microanalytical fluorescent techniques, they are investigating the occurrence of significant degrees of pulmonary edema formation in this condition. This is another example of bringing together two important research areas.

As the cardiovascular physiology group becomes well established, more and more opportunities for interaction will become apparent, and hopefully others in the Jefferson community will develop collaborative research studies with the cardiovascular physiology research team.
Hematologic Research at the Cardeza Foundation

by Allan J. Erslev, M.D.

In 1939, Thomas Drake Martinez Cardeza and his wife, Mary Racine Cardeza, established the Cardeza Foundation as a Hematologic Research Institute in the Department of Medicine of the Jefferson Medical College.

The Charter of the Cardeza Foundation specifies that it shall serve as the Division of Hematology in the Department of Medicine and that its members be teachers or clinicians as well as investigators. Its Director, The Thomas Drake Martinez Cardeza Research Professor of Medicine, is responsible for hematology teaching for all the affiliated units of the Jefferson Medical College of the Thomas Jefferson University and he reports directly to the Chairman of the Department of Medicine. However, the Cardeza Foundation, because of its broad academic responsibility to hematology, also serves the Blood Bank and Blood Donor Center for the Hospital, as the Division of Hematology of the Department of Pediatrics and as a hematologic resource for the Departments of Biochemistry, Physiology and Pharmacology. In short, it serves as an interdepartmental Blood Center at Thomas Jefferson University and its Director reports directly to the Board of Trustees through an Advisory Board made up by members of the Board of Trustees, the Administration and the Executive Council.

The Cardeza Foundation under the Trusteeship of J. Harry Wagner, Jr. Esq. and the Fidelity Bank provides approximately one-half million dollars a year for salaries of key research personnel. The University, which receives 20% indirect cost allocation by the foundation, provides space and physical facilities.

On top of this “hard money” basis, members of the Cardeza Foundation bring in about one million dollars a year in research grants and contracts. There has been a steady increase in research support and activities over the years and the Foundation personnel now consists of a staff of 16 fulltime M.D.s and Ph.D.s, five Fellows, two graduate students and about 60 non-professional members. In 1960 it moved from its original quarters in the College Building to a three-story building on Sansom Street. After 15 years there it moved in April 1975 into three completely renovated floors in the Curtis Building. Here it is located next to the other divisions of the Department of Medicine and the beautifully redecorated 16,000 square feet of research space includes a small library-conference room, a photographic laboratory, animal house and operating room, isotope rooms, workshops, offices and laboratories of individual investigators.

There are special quarters for rotating residents and for clinical and research Fellows and also laboratories for routine and sophisticated hematologic tests used by the staff in their clinical consultative service at the Thomas Jefferson University Hospital. The Cardeza Hemophilia Center and the Cardeza

Dr. Erslev is the Thomas Drake Martinez Cardeza Research Professor of Medicine and Director of Hematology.
they have isolated a new fibrinogen, Fibrinogen Philadelphia, and used a variety of biochemical tools to dissect and identify the biologically active fragments which appear during the transformation of fibrinogen to fibrin.

Of great importance to hemostasis and thrombosis is the transformation of a circulating "inert" platelet to a sticky cell capable of arresting bleeding or inducing thrombosis. This platelet aggregation is initiated when blood vessels are injured and it may be enhanced or retarded by various drugs. The work of Drs. Melvin J. Silver, J. Bryan Smith and associates has demonstrated the importance of prostaglandin synthesis in platelet aggregation. Dr. Smith's early work has helped to explain why aspirin, a prostaglandin inhibitor, is such a potent inhibitor of platelet aggregation. Since both excessive bleeding and excessive thrombosis are life threatening events, further elucidation of platelet prostaglandin metabolism may have wide reaching implications. The capabilities of Cardeza to undertake research into all aspects of hemostasis and thrombosis will be enhanced by the addition of Dr. Scott Murphy who will join the Cardeza Foundation in May 1976. Dr. Murphy is known for his studies on platelet preservation and platelet transfusion, and has been instrumental in developing the use of platelet concentration in clinical medicine.

Through the tireless efforts of Dr. Shapiro, a state and federally supported Hemophilia Center has been established at Jefferson. This center, staffed by a full time nurse, a social worker-coordinator, and supported by clerical and laboratory facilities, provides comprehensive medical, hematologic and social support for about 120 patients with hemophilia and for their families. Preventive management with medical, social and emotional restoration is attempted through home therapy with Factor VIII concentrates, surgical correction of joint deformities and genetic and social counseling. The Hemophilia Center is also the coordinating center and reference laboratory for a national program aimed at studying the natural history of hemophilia and its major complications, particularly the development of inhibitors to Factor VIII. This study will eventually include some 1500 patients.

**The Red Blood Cell Unit**

The effect of abnormal hemoglobins, such as sickle cell hemoglobin, on normal physiology, is being studied in a number of ways in order to obtain information useful for the treatment and prevention of these effects. The identification and characterization of abnormal hemoglobins have been hallmarks of research done by Miss Jean Atwater, and several hemoglobins, such as Hemoglobin Philadelphia were first described and identified at Cardeza. Studies of protein synthesis in reticuloocytes have led Dr. Edward J. Burka to propose that hemoglobin is produced by ribosomes lying free in the cytoplasm while membrane bound ribosomes are more involved in the synthesis of enzyme and other red cell proteins. With Dr. Samir K. Ballas, he has studied the effect of membrane injury on lipid synthesis and has described a close relationship between lipid turnover and red cell survival. The relationship between red cell enzymes and red cell survival in the newborn is the subject of a similar study by the pediatric hematologist, Dr. Susan F. Travis.

The Transfusion Unit, directed by Dr. Burka, is working on perf ecting a blood component preparation and treatment and will shortly provide patients at Thomas Jefferson University Hospital with leukocytes as well as with platelets, red cells and plasma. In order to be benefi t, leukocytes have to be matched by tissue typing and mixed lymphocyte culture testing and this service is provided for leukocyte recipients as well as for kidney transplant recipients by the tissue typing laboratory directed by Dr. Bulova.

A Sickle Cell Center will be established along the patterns of the Hemophilia Center with emphasis on treatment, prevention, counseling and research. Studies of molecular adjustment of the sickle cell hemoglobin by means of cyanate and other chemicals will be pursued.

**The Immunology Unit**

The lymphocytes, which for years were thought to be useless end-cells on their way to final elimination, have suddenly become the most exciting cells in
the body. They carry the immunologic knowledge of the body and are capable of transforming into antibody producing cells or into cells directly fighting intruders and abnormal, especially malignant, cells. The surveillance of the body with these cells is imperative for survival and numerous hematologic and non-hematologic disorders have been related to either over, under or dysfunction of these cells.

Dr. Stephen P. Hauptman and Dr. Stephen I. Bulova are actively engaged in the study of B and T cell function, antibody synthesis and the effect of drugs, such as cortisone. Dr. Hauptman has discovered that albumin and antibody of the IgA type are synthesized together and released as a complex. This complexing function of albumin may be of great potential importance in the immunologic homeostasis in the body.

The Leukemia and Lymphoma Unit

Dr. Farid I. Haurani was one of the early Directors of Acute Leukemia Group B, a cooperative NIH research unit studying the management of patients with leukemias and lymphomas. Currently, 125 patients in various affiliated hospitals of the Thomas Jefferson University are undergoing protocol treatments under close supervision and observation. The studies of this group have played a major role in our present, far more optimistic outlook on patients with leukemias and lymphomas.

Certainly, a 95% remission rate in children with acute leukemia and a hopeful anticipation that about 50% of these children may be cured of their disease are results no one dared to dream about 15 years ago. Most of the clinical members of the Cardeza Foundation both at Jefferson and at the affiliated hospitals participate in this research program.

The Erythropoietic Unit

Elucidation of the physiologic control of red cell production is a major research aim at the Cardeza Foundation. It is known that red cell production depends on the presence of a number of minerals and co-enzymes, and that it is controlled by a renal hormone, erythropoietin. The interaction of these factors in the bone marrow can explain the pathogenesis of a number of anemias, but more importantly may throw a light on the control of normal and abnormal growth. In addition, the study of these factors has led to the identification of a specific deficiency syndrome, the anemia of chronic renal disease, anemia caused in part by a lack of erythropoietin and probably correctable by replacement therapy with this hormone. Since it is anticipated that within a few years, about 60,000 patients with chronic renal disease in the U.S.A. will be kept alive by home dialysis, it is imperative to enhance the quality of their lives by preventing the anemia by replacement therapy.

The mechanism of erythropoietin production of the kidney is studied by Dr. Kazal, me and my associates. Although isolated perfused kidneys will produce large amounts of erythropoietin, kidney extracts do not contain this hormone. It is hoped that this is not a question of lack of storage, but rather inactivation during the extraction period. A lipid inhibitor of erythropoietin has been demonstrated in renal extracts and it is being identified in order to develop a way by which it can be removed and permit isolation and mass production of erythropoietin for clinical use. The action of erythropoietin on the bone marrow stems cells is being studied by Dr. Ruth Silver and me both in vivo in patients and laboratory animals and in vitro in cultures of normal and abnormal bone marrow. Furthermore the requirements of the bone marrow for iron, vitamin B12, and folic acid have been studied by Dr. Haurani. Recently he has demonstrated that vitamin B12 may act by producing a key enzyme (thymidylate synthetase) in folic acid metabolism. Much data and many hypotheses have been produced but still only few facts.

Many other studies are being carried out at the Cardeza Foundation, some pilot studies aimed at prospecting new ideas, some opportunistic studies because of the chance availability of patients with unusual clinical manifestations and some long-term evaluations of frequently occurring, but poorly understood clinical problems. In all of these studies, and in all of the activities of members of the Cardeza Foundation, the common theme is a desire to understand pathophysiologic mechanisms and make new information available to sick patients and future physicians.

Dr. Louis A. Kazal (right): studying the mechanism of erythropoietin production of the kidney
Extramural Jefferson Researchers

Alumni investigators are making scientific contributions in a variety of disciplines and settings.

by Joy Roff Mara
Pharmacologic Studies
in an Institute Setting

In assessing possible sources for basic science research funding one would probably think first of the Federal government and last, if at all, of private industry. With prominent exceptions like Bell labs, industry-sponsored research has been notoriously targeted and directly self-serving. In 1967 Hoffman La-Roche opened the drug industry's first independent subsidized institute for fundamental research, with the practice of good science the only stated aim and requirement for funding. One of the original staff members, Dr. Sidney Spector (Ph.D. '56), reports that Hoffman La-Roche has kept its word and given the Roche Institute of Molecular Biology a sustained and adequate level of funding with no interference and no quid pro quo. Significantly, the test of good science has not been administered by the company. Peer review, by Institute associates and annually by a scientific advisory board made up of academics and NIH staff (including since 1967 six Nobel Laureates), provides the scientific quality control.

Working at the Institute has several marked advantages, not the least of which is freedom from want. Roche staff members are not permitted to receive outside funding, and very few are sentimental about their former involvements with the grant applications process.

Set up much like NIH, the Institute has a small nucleus of permanent members, with a larger complement of post doctoral Fellows, visitors and scientists on sabbatical. Because most of the permanent members like Dr. Spector hold appointments at nearby New York City medical schools and universities, graduate students and residents also participate in Institute research projects. Currently, for example, Dr. Spector is supervising a third year anesthesiology resident on an optional rotation at Roche from Columbia's College of Physicians and Surgeons where Spector is an Adjunct Professor. "The international background of the scientists and the frequent turnover of personnel makes the Institute a very exciting place to be," Dr. Spector notes, "and the constant influx of new ideas and enthusiasm makes a definite contribution to research productivity."

The physical amenities at the Institute also are enviable. All the laboratory and support facilities needed are contained within an aesthetically pleasing, modern design structure, including conference, symposium and library areas. The building has clearly been designed for laboratory people as well as laboratory animals, and Dr. Spector says staff interaction and socializing add to the pleasant atmosphere.

Dr. Spector's particular research interests are pharmacologic, and of his three broad programs two are concerned with hypertension. He has worked extensively, for example, with the neurotransmitter norepinephrine, which is elaborated by the central nervous system. Studying the synthesis, regulation of synthesis and the degradation of this material in hypertensive animal models, Spector has followed the neurotransmitter throughout the course of hypertension, particularly in the heart, the blood vessels and the brain.

One of the results of this work has been to demonstrate the presence of norepinephrine and the enzymatic machinery necessary for its production in isolated brain microvessels. This provides additional evidence for the neuronal regulation of cerebral microcirculation.

Collagen production has been another focus of Dr. Spector's work in hypertension. On the premise that hypertension is an insult to the body, it seemed reasonable to posit that synthesis of the connective tissue protein, collagen, might be induced during hypertension. Spector discovered that extraordinary collagen production does occur in hypertension, and because its deposition in the blood vessels produces further impairment and rigidity, levels of hypertension are thereby increased and a self-perpetuating cycle created. Once this cycle was understood, Dr. Spector found that antihypertensive drugs can reduce levels of new collagen production, and he is now investigating mechanisms to modify or remove the tissue already deposited.

Immunopharmacology, specifically generating antibodies to small molecular weight substances of pharmacologic interest, has been a third program of interest for Dr. Spector. Some agents, such as the endogenous norepinephrine and many drugs, are too small in themselves to promote antibody production. When conjugated onto a carrier of sufficient mass, however, they can attain the critical size necessary for antibody development.

Once antibodies have been generated, they are immediately useful in quantitative studies employing the radioimmunoassay technique. Their production with regard to exogenous agents opens up the broader question of the possibility of modifying the pharmacology of drugs. Dr. Spector is currently investigating antibodies that could be used therapeutically to reverse drug toxicity in cases, for example, of allergy or overdose. A corollary study is involved with the possibility of potentiating a drug or other agent once an antibody has modified or inhibited its action.

Antibody production is also useful in following the pharmokinetics of a drug, ascertaining where specifically in tissue and subcellular regions a drug goes. Previously, radioactivity was used in such determinations, but this has been an imperfect method. Because drugs are metabolized during their course through the body, the radioactive probe may be attached to what eventually becomes a metabolite. Once antibodies are available, however, immunofluorescent techniques can be employed. Immunofluorescence is more sensitive and specific; because it recognizes only the antibody,
the course of the drug in question can be more correctly and particularly followed. Antibodies have already been successfully generated for opiate alkaloids, barbituric acids, catecholamines and acetylcholine, among others.

A number of the permanent staff members and the prime mover of the Roche Institute are, like Dr. Spector, alumni of the National Institutes of Health. From 1956 to 1967 Spector worked in the Laboratory of Chemical Pharmacology at the National Heart Institute and the Laboratory of Experimental Therapeutics. He feels his close work with clinicians and clinical problems during his stay at NIH has been of lasting value and has made him wary of losing perspective in work with animal models. Some of the work he is doing now had its inception at NIH.

Dr. Spector studied at Jefferson's inchoate Graduate School from 1952-1956 as the first student of Dr. Kwang Soo Lee. Although his connections to the rest of the institution were somewhat informal during those years, still Dr. Spector has a strong feeling of allegiance to the new University. Dr. Lee has since been preferred and accepted another position, something which seems to be endemic of the first rate scientist. For the proven researcher there seems always to be that Circean "other offer" to be considered along with one's quotidian responsibilities. Dr. Spector is no exception, having received his quantum of advances from other institutions. For the moment, however, the Roche Institute's own enticements seem at least sufficient to make any such consideration a very difficult one.

Clinical Investigations in Cancer Immunology

Dr. Carl M. Pinsky '64 is a clinical researcher at the Memorial Sloan-Kettering Cancer Center who takes his clinical responsibilities as seriously as his scientific. Management of a cancer patient, especially in the advanced stages of the disease, is emotionally difficult and, Dr. Pinsky feels, has been poorly handled traditionally. "Particularly in my early training years the patients we worked with had been shunted to the back wards where they were largely abandoned. Even the language of the cancer patient's medical history typically began, 'This unfortunate 53-year-old doomed man...'. We're trying now to get away from the hopelessness fixation, in part by keeping an individual as an outpatient as long as is feasible. I encourage my patients to make living as normal a life as possible their only concern and to let us worry about the disease."

Approaching cancer research immunologically, Dr. Pinsky says he chose this specialty because it was a young field with ground floor opportunities. His experience has since confirmed that judgment; the two-man team with which he began his tenure at Sloan has now grown to a group of medical oncologists, a surgeon, Fellows, nurses and a large staff of support personnel. Pinsky attributes this in part to an administration, specifically Director Robert Good, President Lewis Thomas and Dr. Pinsky's Service Director Dr. Herbert F. Oettgen, that sees cancer immunology as a legitimate undertaking rather than as the stepchild it has sometimes been regarded.

One of Dr. Pinsky's areas of interest has been immunodiagnosis, specifically the use of the carcinoembryonic antigen (CEA) to determine the existence, type and stage of cancer. In a test involving 1200 patients, 800 of whom had some type of cancer, CEA levels were proven unreliable indicators of the exis-
tence of cancer; some patients with benign disease, for instance, had elevated CEA levels, while levels remained normal in some with malignancies.

CEA levels, however, have been shown to have prognostic value at later stages of treatment. In a study of colon cancer patients, for example, Dr. Oet­
gen's group, of which Dr. Pinsky is a member, found that when the cancer is surgically removed elevated CEA levels invariably return to normal. The recurrence rate is also closely tied to CEA level elevation, a phenomenon which is especially useful diagnostically because it often occurs before the recurrence can be observed clinically. Dr. Pinsky has shown additionally that CEA levels are less likely to rise with local tumor recurrence than they are when liver metastases have occurred. Since there is some evidence that early detection and removal of liver metastases can prolong life, this study has obvious clinical significance.

In as yet inconclusive studies, however, routine laboratory procedures like liver function tests have been projected to be as reliable in predicting the stage or progression of colon cancer as the CEA test has proven to be. Investigation is now underway to determine whether an expensive procedure like CEA measurement actually is needed.

Evaluating the immunocompetency of patients for prognostic purposes has been another thrust of Pinsky's work. Using the skin-sensitizer DNBC (2,4-di­
nitrochlorobenzene) in a group of patients with various types and stages of cancer, it has been shown that those who respond positively to DNBC have a significantly lower recurrence rate after definitive cancer surgery than those who failed to respond. When patients are grouped by extent of disease, where there are no metastases patients who are DNBC positive progress better clini­
cally than those who are DNBC negative. For the group in which metastases have occurred, the trend still favors the DNBC positive patients, but Dr. Pinsky feels that the evidence is less convinc­ing. One explanation is that once metastases have begun, the biological action of the tumor becomes more important than the immune response, although Pinsky notes that there are any number of other possible explanations as well. It seems, however, that the prognosis for patients who are DNBC negative with no metastases is almost as bad as that for patients in whom metastases have al­
ready occurred. Dr. Pinsky cautions that from this study one cannot make absolute conclusions applicable to all types of cancer at all stages of progression. "There has been no evidence to the contrary," he says, "but when we broke our groups down by disease and extent of disease, we did not feel the numbers were statistically sufficient."

What Pinsky calls the Holy Grail of cancer immunology, the consistently elu­sive human tumor specific antigen, is the subject of many studies despite two dec­
ades of fruitless pursuit. Tumor specific antigens, substances appearing only when cancer or a specific type of cancer is present, do exist in animals and are in­
valuable in analyzing tumor behavior. Because techniques for finding spontane­
taneous antigens in man are still crude, it has been postulated that they might be more profitably detected in patients hyperimmunized with material from their own tumors. This is known as active autologous immunization, a technique that Dr. Pinsky feels will become increasingly important in immunology's future.

Because animal studies indicated that immunotherapy was most successful when tumor specific antigens were present, oncologists proceeded on the assumption that these antigens would eventually be found in humans and un­
dertook clinical trials with immunopo­
tentiators which had previously been used in animal work. As far back as the turn of the century it was reasoned that even non-specific immunostimulants might be effective in cancer treatment. In 1935 a forgotten researcher named Holmgren first reported some success using the tuberculosis vaccine BCG on cancer patients, but he was largely ig­
nored. Others have shown more re­
cently that percutaneous BCG vaccina­
tion prolongs chemotherapy-induced remission in patients with acute lymphoblastic leukemia.

Dr. Pinsky's own studies have confirmed the value of BCG as a therapeutic agent. In treating malignant melanoma, he found that the intrallesional injection of BCG usually induces tumor regression in injected tumors, though rarely in non-injected ones. Response rate is best if a patient is immunocompetent and if the disease is confined to the skin. To translate the intrallesional success into a systemic effect, the group injected BCG into the skin of melanoma patients with lymph node metastases from whom all tumors had been removed. In a random group they found that contrary to two other recent reports, BCG did not prevent tumor recurrence in this high risk group. Differences in techniques and patient population could account for the conflicting test results, but the question of BCG's efficacy in this situation remains as yet unresolved.

Complicating the use of BCG are its sometimes considerable side effects and even occasional life threatening toxicity. This has encouraged scientists to look for other, non-living immunopotentiators and has led the MSKCC group to experiment with the use of Corynebacterium parvum (C parvum), both intralesionally and systemically. While the systemic study is still ongoing, intratumorally C parvum would appear to have no extraordinary advantages over BCG. MER, a BCG extract, is also being studied, with some positive results beginning to emerge. Dr. Pinsky stresses, however, that he has never seen any of these agents cause regression in advanced cancer in organ systems.

Immunotherapy trials have been done empirically, and few efforts have been made to determine optimal dose and scheduling of the various agents. Although the permutations found in different studies are infinite, scientists have begun trials of specific agents to establish these parameters definitively. The group at MSKCC is now conducting phase I clinical trials on C parvum and Levamisol, an antihelmithic reported useful in preventing recurrence in certain high risk cancer patients.

In addition to active autologous immunization, Dr. Pinsky feels that synthesis or extraction of the active principle(s) from immunopotentiators to minimize possible toxicity will be a primary thrust of immunologic research in the near future. He is also convinced that multimodality studies, not done currently because the risks and benefits involved are largely unknown, would be invaluable both to researchers and patients alike. 'I'd like to see us take non-terminal patients who are ordinarily considered inoperable, have a surgeon remove every bit of cancer he can, and then begin chemotherapy and immunotherapy, taking into account the immunologic effects of the combination and timing the treatments accordingly. This is the direction in which I think cancer research is going.'

While recent publications affectively detailing the acrimony surrounding the discovery of DNA would lead one to expect otherwise, Dr. Pinsky describes collaboration with peers nationally and internationally as common, amiable and open. The friendly association Pinsky outlines may seem like a closed club, but he insists it is more properly a network, running primarily from Sloan to the NCI, to the M.D. Anderson Center, UCLA and Roswell Park, for the early and seemingly jealousy-free dissemination of information. He speaks enthusiastically and knowledgeably of the recent discoveries in all areas of cancer research, uncompromised by the specialist's proclivity to ignore or denigrate the successes of another approach.

When Carl Pinsky attended Jefferson it was viewed primarily as a clinician's school, with a good deal less emphasis on research or academic medicine. While the way in which JMC was perceived was no advantage for graduates interested in high powered post-graduate research training programs, Dr. Pinsky feels strongly that the clinical emphasis was a plus for his research competence. "Being able to interact with patients as a clinician gives me an advantage in the clinical research setting. If I'd had less clinical training and exposure as a student, working with animal models in the lab might have been my only realistic option."

An Interdisciplinary Approach to Ophthalmologic Research

Asking a researcher to explain the process of scientific discovery is somewhat like asking a poet to explain how a particularly apt phrase came about: hard work and extensive preparation are always credited first, but at a certain point enters the almost mystical concept of inspiration. Georgetown University Ophthalmology Professor Vernon G. Wong '58, for example, was absentmindedly working on his backhand in a tennis game with his son when the idea for his most recent research project occurred to him. When an experimental model was developed in the lab, his initial proposition proved valid and has since opened up what promises to be at least ten years of productive research.

In investigating retinal degeneration, a common cause of blindness, Dr. Wong postulated that blindness might be caused by the body's inability to deal in certain cases with the molecule rhodopsin, the major biochemical mediator of vision in the eye. Working with primates, he immunized rhodopsin systematically in low concentrations. He found that at these levels the molecule which in essence allows us to see is the most potent "poison" with which he has ever worked; and the blindness produced is irreversible. The investigation is still in its preliminary stages, but in its course should involve many different disciplines including biochemistry, histopathology, immunology and electrophysiology.

The interdisciplinary approach has been something of a constant with Dr. Wong, whose own background is well suited to it. Initially interested in obstetrics and gynecology, Wong had a Fellowship from Johns Hopkins while he was a student at Jefferson, spending week-ends in Baltimore to study vitamins and intrinsic factor. After an oph-
Dr. Vernon Wong: The major biochemical mediator of vision in the eye can produce irreversible blindness when immunized systemically.

phthalmology residency at the University of Pennsylvania Graduate Hospital Dr. Wong joined the full-time staff of the Ophthalmology Branch of the National Institutes of Health. One of his projects there involved working with National Cancer Institute researchers who were studying the immune response and antitumor drugs in relation to the rejection phenomenon. Because some inflammatory eye diseases are related to the immune disorders, he applied the findings of the cancer study, particularly the use of antimetabolites and immunosuppressive agents, to ophthalmology and the treatment of inflammatory blinding disease.

Another research interest that has involved Dr. Wong with scientists from other disciplines has been the study of cystinosis. This genetic disorder is a result of an amino acid abnormality in which insoluble cystine crystals are deposited throughout the body. The most pernicious result of this process is eventual renal failure.

Because deposits of these crystals also occur in the eye, Dr. Wong was able to contribute an ophthalmologic description of the disorder and to help improve diagnostic methods. The earliest possible and most reliable diagnostic procedure in infants, in fact, is now an ophthalmologic one. Wong stresses the team nature of the effort, which has involved geneticists and specialists from many other fields. The group has made diagnosis of cystinosis in utero through amniocentesis a reality, and genetic counselling and screening can now alert carriers to the risks before they conceive children. With kidney transplants and dialysis available, cystinosis is no longer invariably fatal. Dr. Wong has found this project a particularly rewarding one, because he has been involved in its progression from theory to clinical application.

Although members of the research team are now located in different parts of the country, the cystinosis study continues. In addition to attempting to unravel the basis of genetic biochemical disorder, researchers are also investigating specific agents which might reduce the cystine content in the tissue. Dr. Wong is participating in this work, and has also become a sought-after clinical consultant when cystinosis is suspected, often traveling to different parts of the United States for diagnostic purposes.

As a practicing ophthalmologist, the inflammatory condition known as presumed ocular histoplasmosis interested Dr. Wong, and he has recently made it a research interest as well. Using rabbits and monkeys in attempts to develop an experimental animal model for ocular histoplasmosis, he hopes to be able to study the mechanism of pathogenesis of the disease and eventually a means of treatment.

Although Dr. Wong’s primary orientation is research, he is happy with the mix of teaching and clinical exposure he has at Georgetown. As a teacher he is primarily involved with residents, and as a clinician 30 to 40% of his work is referral. He also enjoys the opportunity to perform ophthalmic surgery.

The chance for variety and for a university atmosphere was part of the reason Dr. Wong left NIH in 1972 after ten productive years. As a measure of his NIH achievements, when Congress created the special National Eye Institute in 1970, Dr. Wong was chosen its first clinical Director. “NIH was an exciting place to work,” explains Dr. Wong, “but the conditions at Georgetown are optimal, and there is no question that quality research can be done here.” Dr. Wong also notes that he has always found his Jefferson training to be second to none.

Vernon Wong is a gentle and very private man whose enthusiasm for scientific research consistently breaks through his personal reserve. Although he says he enjoys jogging, photography and being with his wife, who is a pharmacist, and his two sons in their Rockville home, when he mentions a desire to become involved some day in cancer research, one can somehow imagine that he will also continue to work on his backhand.
With the escalating costs of biomedical research and the government's increasingly grudging allocation of funds for the purpose, attempts to economize where feasible, by building one's own equipment for example, are of necessity becoming more common. Dr. William W.L. Glenn '38, however, was making contributions to cardiothoracic surgery that wouldn't offend anyone's sense of budget long before budget was much of an issue at all.

In 1948-50, for instance, Dr. Glenn, a Professor of Surgery at Yale University School of Medicine, helped build the first artificial heart with a pump to bypass one and subsequently both sides of the heart. A prototype of the artificial heart models currently being refined by NIH and other investigators, it featured a rubber ventricle driven by compressed air. The technique of the right heart bypass developed in this regard and reported in 1950 was the one later used in the first successful open heart operation in man, pulmonary valvulotomy. The total materials cost of this significant first step was $25.00.

A surgical technique for mitral valvulotomy originated by Dr. Glenn totaled a materials cost of only $.05. In operations for mitral valvulotomy, surgeons had previously interrupted the fused commissures with the blunt force of a finger or the cutting force of a knife. The accidental discovery of an open-ended tailor's thimble in a drawer of a newly-purchased antique chest suggested to Glenn the idea of delivering the necessary blunt force through the open end of such a thimble, priced at one nickel. Clinical trial subsequently revealed that the sequential use of tailor's thimbles of graduated sizes ensured a large valve orifice, and in 1969 Glenn reported the use of the thimble valvulotome in more than 200 patients with mitral stenosis.

Dr. Glenn has devised several other surgical techniques for various cardiothoracic conditions. In the patent ductus operation, for instance, he contrived the technique of suturing the ductus prior to division, which has improved the mortality rate for this procedure. In large artery surgery he began deliberately lowering blood pressure using hypotensive drugs, making operations on the aorta and its major branches less hazardous. Dealing with open heart surgery, Glenn applied electricity to the heart to produce controlled cardiac fibrillation. In many open heart operations, this procedure has proven useful in preventing air embolism, Seeking a better operative approach to the high-pressured areas of the blood vasculature system he initiated the application of a prosthetic tube or graft to extend the chambers of the heart and lumen of the vessels. (The prototype for the fabric diverticulum now used was a rubberized $.25 doll stocking.) The use of the closed rubber diverticulum proved simpler and safer than previous methods of approach, and as such encouraged further development of digital intracardiac surgery.

In addition to surgical techniques, Dr. Glenn and his associates have also conceived original operations. Since 1954, when he first reported success in dogs with a superior vena cava-right pulmonary artery anastomosis, Glenn has been involved with this procedure, which is predicated on the fact that the arterial
pressure in the lungs is lower than in any other part of the body, and is not great enough to require a pulsating ventricle to produce blood flow. Glenn's interest in bypassing the right heart entirely stemmed from unsatisfactory results with a systemic artery-to-pulmonary artery shunt performed on several patients with tricuspid atresia. With the traditional shunts, congestive failure or partial to complete closing of the shunt were frequent complications.

The cava-pulmonary artery shunt, generally referred to as the Glenn operation, was first applied clinically in 1958 and has proven a highly successful palliative measure in numerous patients so treated since that time. The shunt is particularly well-suited in instances of uncorrectable congenital malformations of the right side of the heart and diminished blood flow to the lungs, the principal such condition being tricuspid atresia. In some cases, however, after a number of years of clinical improvement following a cava-pulmonary artery shunt, symptoms of hypoxia recur. To ameliorate this problem Dr. Glenn made a carotid artery-jugular vein fistula on animals who had undergone the SVC-RPA procedure some years earlier. After good animal results the creation of an arteriovenous fistula between the right axillary artery and vein was performed on humans and has proven an effective means of improving oxygenation in patients with SVC-RPA anastomosis.

Perhaps Dr. Glenn's most important contributions have been in the area of stimulation of excitable tissue from the interior by radiofrequency transmission, i.e., the pacemaker. The group at Yale was the first to use radiofrequency stimulation clinically, and in 1959 his artificial cardiac pacemaker was the first implanted unit to be used clinically in the Western hemisphere. Since 1966 Dr. Glenn's group applied the principle of electrical stimulation by RF transmission to long-term ventilatory support by phrenic nerve stimulation. This diaphragm pacemaker has enabled quadriplegics and patients with the rare Ondine's Curse to function without a respirator for up to 12 hours a day. The longest time respiration has been sup-ported by the pacemaker is five years for the quadriplegic and seven years for patients with Ondine's Curse. While Dr. Glenn points out the cost value this research has returned to the taxpayer by getting quadriplegics out of $300-a-day intensive care units, he mentions first the rewarding personal aspect, the revolutionary improvement in the quality of life for affected patients.

The pacemaker project, which has been supported by the National Heart and Lung Institute for 17 years, is now investigating the application of radio-frequency stimulation to emphysema to prevent nighttime build-up of CO₂. Although more careful documentation still is needed, the likelihood of benefit seems good in emphysema patients with hypoxia who also have good diaphragm movement. The clinical use of radiofrequency has opened up possibilities for the stimulation of many kinds of excitable tissue for medical purposes. Dr. Glenn notes that the neural prosthesis field might eventually become a billion-dollar industry just as the cardiac pacemaker field has.

In 1971 when Dr. Glenn assumed the Presidency of the American Heart Association he caused something of a stir with his inaugural remarks, which suggested that bypass surgery for angina, the subject of national publicity at the time, should not prematurely be regarded as a panacea. He took this stand in great measure because the number of hospitals with proper cardiac operative facilities was not nearly adequate for the number of people suffering from angina, should all of them demand bypass surgery. Although Dr. Glenn feels that it will be another five or six years before an authoritative evaluation can be made, he says it has become clear that the procedure does provide symptomatic relief from angina; there is, however, no evidence as yet that longevity is prolonged thereby except in cases where partial or complete occlusions of the left main artery have occurred. He expects that the operation will be clinically indicated for left main lesions and intractable angina, but probably not for the majority of angina variations, and he plans to write a follow-up when more conclusive facts are in.

Dr. Glenn, who received Jefferson's Alumni Achievement Award in 1972, has served as President of the International Surgical Group, the Connecticut Society for Medical Research, the Connecticut Society of the American Board of Surgeons and the Yale Medical Society. Certified by the American Board of Surgeons and the American Board of Thoracic Surgeons, he is a member of many organizations, the American Surgical Association, the Society of University Surgeons and the American Association for Thoracic Surgery among them. He has published extensively in both journals and books.

Although animal research has been an important facet of his work, Dr. Glenn stresses that for him the most exciting part of medicine is working out solutions in a clinical setting. In addition to believing, as one would assume most do, that there must be a reasonable chance of good and little chance of harm for a clinical researcher to undertake a project, Dr. Glenn feels strongly that results of every project should be reported and that follow-up studies should be done, without exception. "It is often 25 years before we can appreciate all the ramifications of a new procedure," he notes. "As a matter of fact, it has been more than 200 years since electrical stimulation of tissue was employed therapeutically, and we are just now beginning to realize how useful it can be."

Spending a day with Dr. Glenn it soon becomes apparent that he is a teacher and a physician as well as a researcher. As the Charles W. Ohse Professor of Surgery Dr. Glenn supervises Fellows, residents and groups of medical students rotating through his service. His referral patient roster is international in composition, though his quietly friendly manner with patients has overtones of the family physician as well as the specialist. Teaching consultations are frequent. As Dr. Glenn points out, "Anyone who writes a textbook has to enjoy teaching." Glenn is the co-author of Thoracic and Cardiovascular Surgery with Related Pathology, now in its third edition. He notes that their major competition is a text originally written by another Jefferson surgeon, Dr. John H. Gibbon, Jr.
The National Institutes of Health have been the center of a great deal of controversy in recent years, some of which has been more political than scientific. Dr. Robert C. Gallo '63, who has been a staff member at the National Cancer Institute since 1965, an era that is now considered to have been something of a golden age for the NIH, has not felt any effects personally from what some feel is an increasingly political atmosphere brought to the Institutes during the Nixon administration when the NIH Director became a presidential appointee. Gallo was a member of the search committee for the Scientific Director of Cancer Treatment for the NCI, for example, and the man suggested by the committee was appointed, seemingly without political complications. This is not to say he feels politicization is without hazard, however.

As might be expected, Dr. Gallo does not view the aggrandization of the NCI under the National Cancer Act with the same dismay many critics voiced at its inception. "The public interest in cancer and the timeliness of the problem make it reasonable to channel more funds into cancer research than in some other areas," he says. "It has already produced better clinical care and will prove its worth in research findings as well. Those who say that the so-called 'War on Cancer' is excessive research targeting are probably partly right, but in the long run cancer research is really basic science research. Those making efforts for funding should keep this in mind. With the public attitude towards science and research at this time, I think it is a mistake to believe that money now allotted NCI would otherwise have been parcelled out equally to the different disciplines. If it weren't given for cancer studies, it probably would not have been spent for biomedical research at all."

Dr. Gallo is now Chief, Laboratory of Tumor Cell Biology, Experimental Therapeutics; his primary interest is in acute myelogenous leukemia, and he is investigating in this connection the group of RNA tumor viruses classified morphologically as type C.

Of the many possible approaches to studying the etiology and pathogenesis of the disease, Dr. Gallo chose to work with the RNA tumor viruses for several reasons. They are known, first of all, to be a primary etiologic agent in the natural production of leukemia in mice, cats, cows, sub-human primates and chickens. It has also proven possible to study them in the laboratory, where leukemia has been produced in species other than the original virus carriers. Additionally, the very nature of all viruses seemed to oblige the study of type C RNA tumor virus involvement in leukogenesis: if it were infectious, perhaps it could also be manageable.

Investigation has, in fact, shown that the viruses can be infectious agents, sometimes, as with cats and sub-human primates, exogenous in the classic manner. In other instances, for example in the mouse, the virus is endogenous, remaining in the animal's genetic information and in this way transmitted to progeny. But this duality has made the RNA tumor viruses more rather than less formidable to deal with, as has their tendency to be slow viruses, difficult to trace and characterize in the lab.

More importantly, not every animal who is infected by virus contracts leukemia. It has thus become clear that while the viruses are involved in the leukogenic process, they may not be by themselves sufficient to produce the disease. Other factors such as chance (what cell they "hit," what chromosome etc.), genetic predisposition, environmental insult or any combination thereof would seem to be additionally required.

Although the viruses are complex mechanisms, progress has been made in their definition, and Dr. Gallo's own work has been some of the most significant. In 1970 shortly after Temin and Mizutani reported the discovery of RNA-directed DNA polymerase (reverse transcriptase) in RNA tumor viruses, Gallo and his associates identified reverse transcriptase in human leukemic cells, the first demonstration of reverse transcriptase in any cell. Dr. Gallo refers to discoveries like these as footprints, traces suggesting to the scientist that he is on the right course, but always demanding additional evidence and new links.

Some new traces began to accumulate in 1972-74 when Gallo's lab, using immunologic techniques, demonstrated that the reverse transcriptase identified in human acute myelogenous cells had biochemical properties indistinguishable from reverse transcriptase found in certain mammalian type C viruses, specifically related to the two known oncogenic primate type C viruses, the woolly monkey and gibbon ape viruses.

The direction in which these footprints seemed to be pointing was, of course, the involvement of the RNA tumor viruses in human leukemia. Attempts to isolate any human tumor virus have been frustrating and controversial, with many virologists prematurely reporting positive isolations that were eventually compromised in some way. Dr. Gallo attributes the difficulty to the fact that cancers in man including leukemias are not virus productive diseases. If and when virus is released it is a rare event and the virus may be defective. In 1975 Gallo and his associate Robert Gallagher reported isolating a human tumor virus from one patient with acute myelogenous leukemia; as would have been expected the virus contained reverse transcriptase and group specific antigen specifically related to the oncogenic primate type C.
viruses, some of which have caused neoplasias in primates under natural conditions. Additionally, a second virus was found which was closely related to the endogenous type C virus of baboons. The isolation was made possible by the discovery of new conditioned culture media, produced from a strain of human embryo cells. For reasons unknown, the isolation has not been successfully repeated with cells from other patients, though it was completed several times over a 14-month interval with cells from the same patient. Presumably, this may be because of unusual genetics in the one patient or a coincidental environmental effect, e.g., the presence of two viruses simultaneously.

Dr. Gallo was able subsequently to carry the process one step further. Through molecular hybridization techniques he has found unambiguous proof that the genetic information for a type C RNA tumor virus was present in the primary tissue of the same patient, as presented in the April, 1976 issue of the Proceedings of the National Academy of Science.

Because every new development in the study of type C RNA tumor viruses seems to pose more questions than it answers, Dr. Gallo is also involved in studying the details of the virus life cycle, particularly in gibbon ape leukemia, a disease very similar to human acute myelogenous leukemia. Primate viruses have only been isolated since 1971, so there is still a good deal of basic information to be compiled that could have interdisciplinary importance as well as pertinence to Gallo’s particular work. While the subject could of course have endless permutations, the scientist’s present goal with this project is to establish to his own satisfaction that the primary genetic information for human acute myelogenous leukemia may involve information derived from primate type C viruses.

As a staff member at NIH, Gallo has institutional responsibilities like grant and contract review, and as a respected scientist he is inundated with manuscripts and society applications to judge. Adding these tasks to his 160 published papers and numerous papers presented at meetings and myriad editorial involvements mentioned earlier, it is not surprising he does not feel he can spend as much time as he would like to in the lab. But frequent visits to other laboratories allow him to keep up with the new techniques and other changes from which it is dangerous to become too far removed, and he insists he has not become an administrator. “My day is primarily spent discussing experiments and meeting with scientists. Call me a lab worker without a pipette.”

Although postal rates make it impossible to list all of Dr. Gallo’s societies and accomplishments, a small sampling includes his having presented the Bryan Priestman Memorial Lecture at the University of New Brunswick, his having received the Dameshek Award from the American Society of Hematology, his Honorary Doctor of Science from Providence College and his membership on five scientific editorial boards including the Yearbook of Cancer. He is a member of the Scientific Board of Trustees of the Leukemia Society of America, Consultant at Roswell Park Memorial Institute and at the M.D. Anderson Hospital and Tumor Institute, and is a member of such learned societies as the American Society of Clinical Investigation and the American Society of Biological Chemists.

Gallo’s enthusiasm for research was evident even in his Jefferson days when he admits slipping out the side door during fracture clinics to spend extra time at Cardeza. But the rigors of a successful scientist’s schedule have not been without consequence for his family. “For the first eight years of both of my sons’ lives I was rarely home from the lab when they were awake. It’s different now, I’m making sure that it is.” Still, amidst describing his enjoyment of a new home in Bethesda, travel and good food, a certain single-mindedness inevitably emerges. “I started skiing with the kids, and I expect to do a lot of skiing this season. I tend,” he explains, “to pursue things fanatically for awhile.”

Dr. Robert Gallo: In 1975 he and his associates reported the isolation of a human tumor virus from one patient with acute myelogenous leukemia.
interim president

At a special meeting of the full Board of Trustees on Monday, April 5, Mr. George M. Norwood, Jr. was named Interim President of Thomas Jefferson University. The appointment was made following the unexpected death of Dr. Peter A. Herbut the previous week (see page 48).

Mr. Norwood, who came to Jefferson in 1965 from the University of North Carolina, served first as Vice-President for Business and Finance and since 1970 as the Vice-President for Planning. In that position he has been largely responsible for devising and then implementing Jefferson's Master Development Program. Prior to his Jefferson appointments, Mr. Norwood was the Chief Business Officer of the Division of Health Affairs at the University of North Carolina. He is a Trustee of the Philadelphia Magee Memorial Rehabilitation Center in Philadelphia and served as National Chairman of the Planning Coordinators Group of the Association of American Medical Colleges in 1973.

A resident of Society Hill in Philadelphia, Mr. Norwood is married and has four children.

new trustee

Donald E. Meads, Chairman and Chief Executive of Certain-Teed Products Corporation, was elected to membership on the Board of Trustees of Thomas Jefferson University on March 1. In addition to Mr. Meads' new position he also serves as a Trustee of International House, the Pennsylvania Academy of the Fine Arts and the National Planning Association and is a Board Member of the World Affairs Council.

At age 55 Mr. Meads is a director of eight other major corporations including the Insurance Company of North America, Western Savings Funds Society, Singer Company and the Quaker Oats Company.

A graduate of Staunton Military Academy and Dartmouth College Mr. Meads received a Masters degree in business administration from Harvard University.

Chairman of the Board William W. Bodine in announcing the election stated, "Our goals in medical education, health care and research are certain to be furthered with the help of such an outstanding business and community leader."

Mr. Meads will serve three years as a Term Trustee.

alumni president

At the Alumni Association's Annual Business Meeting on February 26, a special bicentennial gathering preceded by cocktails at the Penn Mutual Tower and followed by a performance of the Benjamin Rush players, Dr. John Y. Templeton, III took over the Presidency of the Association from Dr. Frederick B. Wagner, Jr.

Dr. Templeton, whose father was a Jefferson graduate, received his degree in 1941. He took his internship at Jefferson, and, after a four-year tour of duty in the army, he returned to Jefferson for a residency in general and thoracic surgery, working with Dr. John J. DeTuerk under Dr. John H. Gibbon, Jr. After various Fellowships and staff appointments at Jefferson, Dr. Templeton became a Clinical Professor of Surgery here in 1957. He was a Professor of Surgery at the University of Pennsylvania School of Medicine from 1964 to 1967 but returned to Jefferson in 1967 with the rank of Professor. He is currently a consultant in general surgery at Chestnut Hill Hospital and Lankenau Hospital, a consultant in thoracic surgery at Wilmington Medical Center, and attending physician at Jefferson.

As a physician, Dr. Templeton performs primarily cardiac surgery, although his group has a broad general surgical practice. His teaching responsibilities are mainly clinical, as is his current research, in which he is working with medical cardiologists to determine optimal methods of management for those having or about to have myocardial infarctions.

Dr. Templeton has held office in many professional societies. Past President of the Philadelphia Academy of
Surgery, the Philadelphia County Medical Society and the Laennec Society of Philadelphia, he has also been Governor from Pennsylvania for the American College of Surgeons. He is a member of the American Surgical Association, the International Society of Surgery, the American Association for Thoracic Surgery and the American College of Surgeons, among many others. Dr. Templeton is certified by the American Board of Surgery and the American Board of Thoracic Surgery.

In Jefferson’s Alumni Association, he has been a Vice-President, a member of the Executive Committee since 1954, and a class agent for the Annual Giving Fund. He says he thinks being elected Alumni President is an honor, but that he does not feel it is appropriate to try to put his personal mark on the Association while he is in office; he hopes simply to continue the Association’s traditional role.

Other officers elected for a one year term are: Gonzalo E. Aponte ’52, President-elect; John N. Lindquist ’43, Peter A. Theodos ’35, J. Woodrow Savacool ’38, Thomas B. Merville ’40, Vice-Presidents; Samuel S. Conly, Jr. ’54, Treasurer; and Norman J. Quinn, Jr. ’48, Secretary. Dr. Aponte is Pathology Chairman.

honored

Standing ovations greeted Martin J. Sokoloff ’20 and I. Charles Lintgen ’25 as they accepted engraved clocks at the Annual Business Meeting of the Alumni Association on February 26. The Executive Committee had elected to honor them and colleagues Reynold S. Griffith ’18 and David R. Morgan ’16 for their many years of distinguished teaching service to Jefferson. Dr. Griffith and Dr. Morgan were unable to attend.

Dr. Morgan was appointed to the Jefferson faculty in 1922 and was promoted through the ranks to full Professor in 1955. In addition to his teaching duties in the Department of Pathology Dr. Morgan also served as curator of the museum. He was a member of many professional organizations including the American Society of Clinical Pathologists, the American Society of Bacteriologists and Pathologists and the American College of Pathologists. Dr. Morgan, the author of over 20 papers, presently is residing with a nephew in Edwardsville, Illinois.

Dr. Griffith also has spent his entire professional career at Jefferson. In replying to President Wagner’s letter of invitation he stated, “Incidentally, this is my 63rd year at Jefferson. In the event you attempt to figure the extra year, 1913-1914, I was a pre-medical student in the first such class at Jefferson. I am presuming you did not know
that Jefferson had a pre-medical course. As I recall it was short lived, one or two years only. This honor from the Alumni is a suitable climax to my medical career.” Dr. Griffith, an internist, has offices in Philadelphia and holds the rank of Honorary Clinical Assistant Professor of Medicine.

Dr. Sokoloff, an Honorary Clinical Professor of Medicine at Jefferson, began his professional career at White Haven Sanatorium in 1922. He remained there as Visiting Physician and later served as Medical Director, a position he held to 1956. In 1951 he was appointed Director of the Barton Memorial Division of Jefferson Hospital and has served as consultant in pulmonary diseases at several Philadelphia area hospitals. Dr. Sokoloff has held office in numerous organizations including the Presidency of the Pennsylvania Thoracic Society, the Laennec Society of Philadelphia, the Pennsylvania Chapter of the American College of Chest Physicians and in 1956 the Alumni Association of Jefferson.

Dr. Lintgen at 84 still sees patients several days a week at his center city office. Presently he is Honorary Clinical Professor of Obstetrics and Gynecology. Dr. Lintgen was promoted to full Professor in 1952 and served in this position until his retirement in 1965. He also is a member of numerous professional organizations including the American College of Surgeons, the American Board of Obstetrics and Gynecology and the American College of Obstetricians and Gynecologists. His son, Arthur, Jefferson ‘66, is an internist practicing in Abington.

parents’ day 1976

This year’s traditional Parents’ Day at Jefferson, sponsored by the Alumni Association in conjunction with the Dean’s Office, brought more than 200 mothers and fathers to the campus for guided tours, lectures and a lunch hosted by Dean William F. Kellow. The morning program included presentations in both the clinical and pre-clinical departments in addition to a showing of the Sesquicentennial film “Of Light and Learning.” Dr. John Y. Templeton, III, ’41, Professor of Surgery, gave the afternoon slide lecture on “Emergency Surgery for Heart Attack Patients.” As Alumni President, Dr. Templeton also brought greetings from the Association.

The sophomore class each year selects a faculty member to address them at the Dean’s Luncheon. This year’s well-received speaker was Dr. Laird G. Jackson, Associate Professor of Medicine, Obstetrics and Gynecology and Pediatrics and Director of the Division of Genetics.

Speaker for the sophomore class was Mr. Duncan Salmon. Dr. Warren R. Lang, ’43, Chairman of the Parents’ Day Committee, served as toastmaster.

black and blue ball

Jefferson’s social fraternity, Kappa Beta Phi, will sponsor its annual Black and Blue Ball on Saturday, May 29 beginning at 9 P.M. in Jefferson Alumni Hall. Tickets for alumni are priced at $15.00 per couple and at $8.00 per couple for students and house staff. All proceeds go to the KBΦ Student Loan Fund.

Music for the evening will be provided by the Brian Pastor Orchestra. Each year Kappa Beta Phi selects a favorite professor to be their guest of honor. This year they chose Dr. Edward H. McGehee, Professor of Family Medicine. For tickets and information, contact Dick Buza, 1025 Spruce St., WA 8-0739.

faculty changes

Dr. Norman N. Cohen promoted to Clinical Professor of Medicine (MCMC)
Dr. Lawrence W. Davis appointed Professor of Radiation Therapy and Nuclear Medicine
Dr. George F. McInness promoted to Professor of Surgery (Wilmington)
Dr. Diran O. Mikaelian promoted to Professor of Otolaryngology
Dr. Dewey A. Nelson promoted to Professor of Neurology (Wilmington)
Dr. Frances C. Schaeffer appointed Clinical Professor of Obstetrics and Gynecology (Daroff)
Dr. William E. Stass, Jr. promoted to Clinical Professor of Rehabilitation Medicine

alumni trustee

Ballots for the election of the Alumni Trustee were mailed to the entire membership on May 4. Chairman of the Alumni Trustee Committee, Dr. Paul A. Bowers, ’37, noted in his message that Dr. Joe Henry Coley, ’34, has served the University extraordinarily well during his first term of office. The committee, following lengthy discussion, recommended to the Association’s Executive Committee that he be nominated for re-election to a three-year term. The Committee endorsed this recommendation at the April meeting.

Serving with Dr. Coley, whose term will expire in June, are Dr. Robert L. Evans, ’52 and Dr. Thomas F. Nealon, Jr., ’S44.

Results of the balloting will be announced in the summer issue of the Alumni Bulletin.

Dr. Coley
1913
Dr. J. Wallace Hurff, 45 Woodland Ave., Summit, N.J., retired in 1972. He is 85 years old.

1915
Dr. Joseph Aspel, 409 Maplewood Ave., Merion, Pa., writes that he has not practiced since 1971.

Dr. Warren S. Reese, 2118 Locust St., Philadelphia, writes that he was honored by the Athletic Club of Philadelphia as one of its surviving founders and because he was a pioneer in intraocular implant surgery in the United States.

1917
Dr. William G. Flickinger, Foxcroft Apts., Jenkintown, Pa., writes, "My family ganged up on me and made me retire. This is what I never advised my patients."

1919
Dr. Samuel R. Luster, 169 S. Formosa Ave., Los Angeles, is semi-retired, still seeing patients at his home. He sends regards to all his classmates.

1920
Dr. Edward W. Schoenheit, 25 Eastwood Rd., Asheville, N.C., has retired. An internist with a specialty in cardiology, Dr. Schoenheit is a former President of the North Carolina and Buncombe County Medical Societies. He is a Fellow of the American College of Physicians and the American College of Chest Physicians.

1923
Dr. Benjamin Haskell, 1427 Spruce St., Philadelphia and Mrs. Haskell, spent the week of the Nobel Prize presentations in Stockholm. This was at the invitation of Dr. Howard Temin, a long-time friend and now Professor of Virology at the University of Wisconsin, who had been named laureate in medicine and physiology. "It was a truly memorable experience" Dr. Haskell stated upon his return. "We were included in all activities, even the annual ball sponsored by the medical students, who were by the way extremely hospitable."

Class Historian Dr. Ernest L. Noone forwarded the following about his classmates.

"Dr. W. Emory Burnett expected to host Dr. George J. Willauer at a joint four city surgical meeting in Philadelphia last March. Emory forgot the date altogether and George, waiting for Emory, saw five inches of fresh snow instead, winced and reached for his overcoat. Emory enjoyed a Florida winter and visits with his Alabama kinsfolk. George, whose culinary skill is well known, also occupies his spare time making soap. 'First' says George, 'take thirty pounds of fat . . .'

1924
Dr. Lawerence Shinabery, 212 Three Rivers N., Ft. Wayne, Ind., spent Christmas in Indiana but most of the winter in the Florida Keys.

1925
Dr. Sigmond J. Shapiro, 550 Butler Rd., Warren, Ohio, was honored by the Ohio State Medical Association for 50 years of service in medicine. Dr. Shapiro was a general practitioner in Warren and delivered hundreds of babies in the area. He spent some years running the Anesthesia Department at St. Joseph's Hospital and is now semi-retired, spending three afternoons a week specializing in allergy. His son, Richard, is an ophthalmologist in Warren and his son, Mark, is an ophthalmology resident at Jefferson.

1926
Dr. Philip B. Davis, 807 Florham St., High Point, N.C., retired in June, 1967. He and his wife spend the winters in Florida and summers in High Point. They hope to attend the 50th reunion in June.

Dr. James H. Tate, 1174 Hilltop Rd., Erie, Pa., retired from general practice in 1971. He and his wife of 40 years have three children, all college graduates, and both boys have their masters degrees. They spend the winters in Florida.

Dr. Max L. Weimann, 10 First Ave., Haddon Heights, N.J., has retired from his practice of medicine.

1927
Dr. Samuel M. Dodek, 5480 Wisconsin Ave., Washington, D.C., has had his portrait presented to the Library of the School of Health Sciences of George Washington University, along with the first tocodynamometer used in the Western Hemisphere. The instrument was devised, and used by him in 1930 to study human myometrial physiology and the effect of certain drugs and agents upon uterine contractions during labor. It also became the prototype of external tocodynamometers used today to monitor labor and the oxytocin challenge test.

Dr. Dodek is Professor Emeritus of Clinical Obstetrics and Gynecology at G.W.U.

1928
Dr. Charles W. Lighthizer, McCauslen Manor, Steubenville, Ohio, had joined a group of six "retired physicians" in May of 1969 to man the Emergency Department of the Ohio Valley Hospital. "We may be retired but we treated 40,000 patients last year." Last June he received the "Outstanding Ohio Team Physician Award," presented by the Ohio State Medical Society and the Ohio High School Athletic Association.

1929
Dr. Joseph C. Hudson, 11608 Balboa Dr., Sun City, Ariz., is a member of the Theodore Roosevelt Council of the Boy Scouts and each summer goes to camp as physician to the Scouts. He also has joined the sheriff's posse of Sun City.

Dr. James P. Ward, 320 Lemoyné Dr., Pass Christian, Miss., and his wife drove through Mexico and Central America to the Panama Canal last October. They flew home and shipped the car. The trip was 3500 miles from the U.S. border.

1930
Dr. Leon L. Berns, 1300 Knox Rd., Wynnewood, Pa., has been promoted to Clinical Professor of Anatomy at Jefferson.

1931
Dr. Edward Gipstein, 181 Broad St., P.O. Box 310, New London, Conn., is practicing clinical cardiology on a semi-retired basis. He is still Chairman of the Department of Medicine and the Division of Medical Education at Memorial Hospitals in New London.

Dr. William H. Newman, 251 E. Grove Ave., Clarks Summit, Pa., and his wife are looking forward to their reunion in June.
and hope to travel to Europe with the alumni trip.

Dr. Nathan Ralph, 2047 Spruce St., Philadelphia, is serving as chairman for the 45th reunion. "I am looking forward to a big turnout."

1932

Dr. Nathan S. Schlezingier, 8378 Glen Road, Elkins Park, Pa., and Mrs. Schlezingier were guests at the New Delhi wedding of the grandson of Dr. Amar D. Matta '31. The Schlezingiers were on a round the world trip incorporating medical meetings and lectures with pleasure.

Dr. Burchard E. Wright, Old Orchard Estate, Ijamsville, Md., retired in July, 1975 from the Food and Drug Administration after 11 years as the Agency's senior biostatistician and epidemiologist in the Bureau of Drugs. He recently returned from the Andean highlands of Peru visiting the archaeological ruins at Lima, Cuzco, Macchu Pichu and other sites.

1933

Dr. Richard I. Barstow, The Village Green, Norfolk, No., has begun his 40th year of practice, associating with another physician. He is enjoying cross country skiing and curling and hopes to join the Jefferson trip to Europe in April.

1935

Dr. Albert J. Blair, Sr., 409 Franklin Heights Dr., Monroeville, Pa., has retired as Chief Medical Director of Consolidated Natural Gas Company. He has been there since 1956, prior to which he had a private practice in Waynesburg. He is past President of the Greene County Memorial Hospital and the Greene County Medical Society. He is also past Director of the American Occupational Medical Association. He and his wife, Helen, have three children.

Dr. R. Marvel Keagy, 3510 Baker Blvd., Altoona, Pa., is practicing pediatrics with two junior partners, Rodney L. Sponsler '62 and John L. Berardinelli '68. He is now Emeritus Chairman of the Department of Pediatrics at the Altoona Hospital, and Dr. Sponsler is Chairman.

1936

Dr. Edmund J. Brogan, 1020 Cedar Grove Rd., Wynnewood, Pa., has retired as Medical Director of Provident Mutual Life Insurance Company of Philadelphia. Dr. Brogan will continue his private practice.

Dr. Oliver E. Turner, 825 Eisenhower Dr., Pittsburgh, and his wife plan to attend the reunion in June. He has just completed a three-year research project correlating glucose tolerance versus insulin assay techniques for diagnosis of diabetes, obesity, hypoglycemia, etc.

1937

Dr. Carl G. Whitbeck, Box 177, RD 2, Hudson, N.Y., gave up his private practice in 1970. He now works for the State of New York and parttime as Medical Director of a nursing home.

1940

Dr. Roger B. Thomas, 8 Vining La., Wilmington, De., writes that his son, Roger, Jr., is a practicing internist in Wilmington and is married with two children. His son, Robert, is a tax lawyer in Wilmington, married with no children.

1941

Dr. Louis C. Blaum, 244 Scott St., Wilkes-Barre, Pa., writes that his son, Louis Jr., is a third-year resident in surgery at Jefferson. "If any of the class has occasion to visit Jeff, look him up and say hello."

Dr. Clyde C. Greene, Jr., 140 New Montgomery, San Francisco, writes that he was sorry to miss the recent American College of Surgeons Jefferson reception, but he is "still laid up by the neurosurgeons. Hope to be ambulatory and able to attend the 1976 reunion."

1944J

Dr. John H. Bland, Upper Valley Rd., Cambridge, Vt., is an Associate Professor of Medicine at the University of Vermont. He and Dr. Leon Sokoloff, a Professor of Pathology at the State University of New York, Stonybrook, have published a book, The Musculoskeletal System.

Dr. John A. Martin, 2037 Crystal Spring Ave., S.W., Roanoke, Va., has been elected alternate delegate to the AMA from Virginia. He is a Clinical Professor of Radiology at the University of Virginia Medical School.

1944S

Dr. Charles V. Dolan, 128 N. Mill St., Birdsboro, Pa., has been accepted for membership in the Berks County Medical Society. He practices family medicine and is an emergency room physician at Ephrata Hospital.

1945

Dr. J. Elder Bryan, Jr., 7926 3rd St., Downey, Ca., is the principal author of HR 10562, a bill for basic health insurance and tax credit.

Dr. John J. Cox, 501 Haddon Ave., Haddonfield, N.J., writes that his eldest son, Jonathan, has been accepted at Jefferson and will begin in September, 1976.
1946

Dr. Charles E. Bickham, Jr., 5920 Searl Ter., Washington, D.C., has been appointed 91st President of the Philadelphia Neurology and Director of the Electrodiagnostic Laboratory at Jefferson.

Dr. Martin M. Mandel, Benson Manor, Ste. 110, Jenkintown, Pa., has been elected the 91st President of the Philadelphia Neurological Society for 1976. Many other Jefferson neurologists have held this position. He is also chief of the Department of Neurology and Director of the Electrodagnostic Laboratory at Jefferson.

Dr. Laurence A. Mosier, 10510 Chapman Ave., Garden Grove, Ca., spent an evening with Gail Li '47 and his wife, Nani, during the recent AMA meeting in Honolulu. "He is well and prospering."

Dr. Leonard Rosen, 5 Arthur Cl., Wallingford, Pa., has contributed his services to the free care of indigent patients in Chester. He has been praised by the community for this effort, notes classmate Martin Mandel.

Dr. Samuel Younger, 5109 Genesta Ave., Encino, Ca., writes that his son, Joel, is a second year student at Jefferson.

1947

Dr. Lewis E. Jones, 1752 Morris Landers Dr., Atlanta, has been promoted to Assistant Professor of Medicine at Emory University. He is Chief of Staff at the Atlanta Veterans Administration Hospital.

Dr. John A. Koltes, 530 Spring La., Philadelphia, completed two years as President of the Medical Staff of Chestnut Hill Hospital and one year as the first physician appointed to the Board of Trustees of the same hospital.

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1948

Dr. Velio E. Berardinis, 632 Prospect Ave., Scranton, Pa., writes that he enjoyed himself at the 27th reunion at Skytop. He is looking forward to the next one. His son, John, is a freshman at Jefferson.

Dr. Ralph Lev, 4 Renee Ct., Edison, N.J., was recently elected to the Board of Directors of the American Committee for the Weizmann Institute of Science at Rehovot, Israel. He is also Chairman of the Physicians Committee for the Institute. Dr. Lev is practicing cardiovascular and thoracic surgery in Edison and is a Clinical Associate Professor of Surgery at the New Jersey Medical School.

1949

Dr. John E. Mills, 123 Congress St., Pasadena, Ca., announces the birth of a son, Peter Thomas, on November 24, 1975.

Dr. Sheldon Rudansky, 520 Franklin Ave., Garden City, N.Y., writes that he visited Israel in the summer of 1975 and presented a paper at the Ichilov Hospital in Tel Aviv. "Quite pleased that my son, Max, is a freshman at Jefferson."

1950

Dr. Charles L. Saunders, 523 Wildwood La., Burlington, N.C., writes that after 20 years he has started limiting his practice to gynecology.

1951

Dr. Douglas F. Brady, 160 McLaughlin Dr., New Kensington, Pa., is practicing solo general surgery and is on the staff at Citizens' General Hospital and Allegheny Valley Hospital. He has two boys, John, a senior in high school, and James, a pre-med student at the University of Pittsburgh.

Dr. Victor F. Greco, Greco Memorial Medical Arts Bldg., R.D. Drums, Pa., has been appointed Medical Consultant for the Comprehensive Health Planning for the State of Pennsylvania. His oldest son, Vic, is a student at Philadelphia School of Optometry, hoping to get into medical school. His oldest daughter is studying to become an operating room technician and his second son is in his first year of pre-med. "We have three more children coming up, all of whom have an interest in medicine."

1952

Dr. Nelson P. Aspen, 633 N. Church St., West Chester, Pa., writes that his five children have become eight by marriage, "and six grandchildren bring us to middle age." He is Chief of Orthopaedics at Paoli Hospital.

Dr. Jerome J. Brody, 3300 Henry Ave., Philadelphia, is a Professor of Medicine at the Medical College of Pennsylvania.

Dr. Raymond L. Cunneff, 30 Alston Ct., Red Bank, N.J., is President of the New Jersey Orthopaedic Society, Director of Orthopaedics at Riverview Hospital in Red Bank, and Associate Attending at New York Orthopaedic Hospital. He continues as surgeon to the New York Giants.

Dr. Robert L. Evans, 144 Sherburne Ct., Weston, Ma., will receive the M.S.M. degree from MIT in May, 1976 after completing the Alfred P. Sloan Fellowship in management science. He received the John C. Leonard Award for contributions to medical education at the Congress on Medical Education in Chicago in January.

Dr. Howard Fugate, Jr., 633 Maple Ave., Dubois, Pa., is practicing internal medicine. His oldest son is a senior at Philadelphia Osteopathy School and his other three sons are pre-med at Penn State. He and his wife have four grandchildren.

Dr. George C. Godfrey, 112 Glenvida Ave., Linwood, N.J., practices general surgery at Shore Memorial Hospital and has an office in Somers Point. He recently saw classmates James Carroll and James Comerford at a meeting of the American College of Surgeons. Dr. Carroll is a urologist in the Oak land area and Dr. Comerford an anesthesiologist in San Jose.

Dr. Jerome J. Lebowitz, 5650 Aylesboro Ave., Pittsburgh, writes that his son, Mark, is a freshman at Jefferson. He is Vice-President of the Southwest Chapter of Jefferson Alumni. His second son will start a pre-med program in September.

Dr. Herbert A. Saltzman, Duke University Medical Center, Box 2904, Durham, N.C., is well and busy. He has one child in college and two still at home.

Dr. Robert M. Zweig, 2936 McAllister St., Riverside, Ca., is studying hydrogen as an alternate fuel and has presented papers in connection with this topic.

1953

Dr. Franz Goldstein, 707 Arlington Rd., Penn Valley, Pa., has been named the Humanitarian Doctor of the Year by the Philadelphia Chapter of the National Foundation for Ileitis and Colitis, Inc. He is Chief of Gastroenterology at Lankenau Hospital and Professor of Medicine at Jefferson.

Dr. August F. Herff, Jr., 8711 Village Dr., San Antonio, Tx., writes that his eldest...
child graduated from Texas University and is working. The second child is in 10th grade and seems to want to attend the Naval Academy.

Dr. Willard S. Krabill, 120 Carter, Goshen, In., is college physician at Goshen College, Medical Director of the High Park Clinic and Medical Staff representative to the Board of Trustees of Goshen General Hospital.

Dr. Robert M. Mead, 3015 El Corte Way, Erie, Pa., writes that two children in college at the same time are keeping him "hopping financially."

Dr. Robert Poole, 419 N. Franklin St., West Chester, Pa., is Chief of Staff of Chester County Hospital. He is President of the Board of Health of Chester County, and Chairman of the Council on Professional Relations and Services for the Pennsylvania Medical Society. One daughter has finished college and is working as a probation officer; two daughters are in college; and one daughter in high school.

Dr. Raymond P. Seckinger, 4285 Tilghman St., Allentown, Pa., is practicing psychiatry utilizing the team approach with correlative therapy. Treatment is coordinated to the client’s needs utilizing psychoanalytically-oriented psychotherapy as the core technique.

1954

Dr. Thomas Aceto, Jr., McKenna Hospital, Sioux Falls, S.D., has been appointed Chairman of the Department of Pediatrics at the University of South Dakota School of Medicine. A pediatric endocrinologist, Dr. Aceto had been Professor of Pediatrics and Deputy Chairman of the Department at the University of Virginia. From 1962 to 1974 he was affiliated with Buffalo Children’s Hospital as Director of Pediatric Endocrinology and Director of Postgraduate Education, and he was also an Associate Professor of Pediatrics at the State University of New York at Buffalo. He is Board certified in pediatrics and a member of the Society for Pediatric Research, the Endocrine Society and the American Federation for Clinical Research. Dr. Aceto was also Acting Director of the National Pituitary Agency in Baltimore and Director of a collaborative project on the effects of human growth hormone from 1965 to 1974. He has many scientific publications to his credit.

1955

Dr. William A. Anthony, Jr., 1016 Charleston Ct., Roseville, Ca., writes that he and Paul Dugan ’56 continue to be employees of a five-man family practice corporation. “We soon plan to enlarge to seven men.”

Dr. Burton S. Benovitz, 425 Tioga Ave., Kingston, Pa., writes that “Madge is now a member of the Pennsylvania State Board of Education, while my daughter, Jane, is a sophomore at Brown.”

Dr. Frederick Lytel, 117 E. Fourth Ave., Conshohocken, Pa., is an Assistant Professor of Family Medicine at Jefferson. “It’s a great program and I’m pleased to be part of it.”

1956

Dr. Joseph L. Magrath, Ashby Rd. & Chestnut St., Upper Darby, Pa., is an Assistant Professor of Surgery at Jefferson.

Dr. Wallace B. O. Wong, 1354 McBain Ave., Campbell, Ca., is Chairman of the Ob-Gyn Department at Santa Teresa Hospital in San Jose. His eldest child, Gregory, is attending Northwestern University. “In the case of classmates travelling in California, stop by.”

1957

Dr. T. Clark Corson, 10 Penn St., Bloomsburg, Pa., is still in the private practice of ob/gyn. He is President of the Board of Education at the Central Columbia School District.

Dr. Stephen J. Kendra, Box 143 Naval Station, San Diego, Ca., is Commanding Officer of the Navy Environmental and Preventive Medicine Unit #5 in San Diego. His son, Stephen, Jr., is a sophomore in pre-med at Notre Dame.

Dr. Ronald M. Match, 10 Medical Plaza, Glen Cove, N.Y., writes that he enjoyed attending the Jefferson Orthopaedic Society Meeting in December and presenting two papers. He is a member of the American Society for Surgery of the Hand.

Dr. Sanford M. Miller, 680 W. End Ave., New York, is an Assistant Professor of Anesthesiology at New York University Medical Center. “Marcia and the two boys (now 12 and nine) are all fine.”

Dr. Joseph F. Rodgers, 1723 Sylvan Ln., Gladwyne, Pa., was installed as President of the Volunteer Faculty at Jefferson at the Annual Meeting in January. A Clinical Assistant Professor of Medicine, he succeeds Dr. Paul J. Poinnard ’41.

Dr. Robert H. Schwab, 632 Montgomery School Ln., Wynnewood, Pa., has two children, Jennifer, age four, and Daniel, age two.

1958

Dr. Edwin R. Concord, 5009 Oxford Ave., Philadelphia, has joined with several other physicians to open a group practice of pediatrics. Dr. Concord is affiliated with Frankford and Nazareth Hospitals and is a Clinical Associate Professor of Pediatrics at Hahnemann.

Dr. Carter N. Davison, Oxford Circle, Tamaqua, Pa., has opened an office for general practice in Hometown, Pennsylvania. He practiced previously in Mahanoy City.

Dr. Donald N. Dubrow, 6536 Crestmere St., Dallas, writes that despite the rigors of internal medicine practice, “we harvested a bountiful crop of corn, beans, summer squash, cucumbers, melons and tomatoes. We live for the winter! Nancy and I continue to breed—boxers—and show them. Daughters Fran, Eve, Karen busy with piano, school, soccer. I have been recertified by the American Board of Internal Medicine.”

Dr. Edward Fine, 43 Kings Highway W., Haddonfield, N.J., is Director of Medical Education for Our Lady of Lourdes Hospital in Camden, one of Jefferson’s affiliates. Dr. Fine is a Clinical Assistant Professor of Obstetrics and Gynecology at Jefferson.

Dr. Marvin Z. Rotman, 59 E. 80th St., New York, is Professor of Radiology and Director of Radiation Therapy at New York Medical College.

Dr. William J. Warren, RR1, Box 149, Fur­long, Pa., has formed the Warren Medical Laboratories, Inc., located in Lansdale, Pennsylvania. Full services are offered.

1959

Dr. Trevor D. Glenn, 5072 N. Van Ness Blvd., Fresno, Ca., is a member of the American College of Physicians, and on its Advisory Panel on National Health Insurance.
Since its inauguration in 1967 the Annual Art Show by the Faculty Wives Club of Jefferson Medical College has become one of the anticipated events of each school year. Open to all members of the University including Medical School alumni and their families the show continues to draw entries from across the country including the 50th state, Hawaii. The ninth exhibition is scheduled again this year to coincide with reunion activities. Dates: May 26 through June 9.

Everyone and everything qualifies. Media entries range from oils to watercolors to ceramics, sculptures, photographs, graphics, metallics, carvings and even needlepoint. It is a noncompetitive, non-judged exhibit and serves as FWC's annual gift to Jefferson.

Out of town entries may be mailed to the Alumni Office, Jefferson Alumni Hall, 1020 Locust Street, Philadelphia, 19107, by May 24. FWC will return them to you by June 14. Please be sure to include information such as your return address, title of work, or affiliation. Exhibitors are invited to a special reception the afternoon of June 2.

Mrs. John H. Hodges, Chairman

Jefferson Art Show
Life in Jerusalem is Remarkably Normal

It is difficult for most Americans to envision life in a country where the continued existence of the nation as a political entity is a matter of everyday concern. Yet Dr. Milton H. Gordon '37, a recent emigre to Israel, says that day-to-day life in that beleaguered area of the world is remarkably normal, perhaps intentionally removed from the cataclysmic issues debated in Geneva and New York. And despite the frequent incidence of terrorist activities the Gordons feel safer walking the streets of Jerusalem at night than they did the streets of Philadelphia. That probably says less about the perceived quality of life in Philadelphia than it does about the compelling sense of community and inter-identification that have attracted so many to the Israeli way of life.

Dr. Gordon's first trip to Israel was on a 1935 tour with a musical group, "The Jeffersonians," with fellow medical student Morton S. Pearl '36. He next returned one week after the Six-Day War in 1967 for a two-month volunteer stint at Hadassah Hospital, accompanied by his wife who lived with him in a nearby Nurses' Residence. He treated non-surgical, non-casualty patients in the Hospital's clinic until the staff physicians returned to normal duty. After the Yom Kippur War in 1973 he again volunteered his services, this time working for six weeks at Kaplan Hospital in Rehovot. The Gordons had become emotionally involved with Israel's people and fortunes through these visits, through Dr. Gordon's ham radio contacts and through Mrs. Gordon's enthusiastic work in the United States with the United Jewish Appeal and the Jewish Federation of South Jersey. "We became knowledgeable about conditions in the country, both the good and the bad. We wanted to make a change in our lives, and we wanted to help if we possibly could."

The change is a major one, but not as drastic as it might first appear. The Gordons sold their home in Haddonfield, New Jersey and bought a condominium in Jerusalem's central residential area, a 15-minute walk from the business district. In terms of comfort and cost it is comparable to those available in center city Philadelphia, and since they had the furnishings from their Haddonfield residence shipped over, the new home looks remarkably like the old.

Neither has their diet had to change in a marked way. Staples, especially fresh fruits and vegetables are available in abundance, and the cost of vital foodstuffs is at this time subsidized by the government. Imported foods are very expensive; a box of U.S. cereal costs more than twice as much as its Israeli competition, which according to Dr. Gordon is just as tasty. Red meat is expensive and inferior in quality to that found in the States, and, with the exception of frozen vegetables, prepared and convenience foods do not exist. Gasoline is $1.90 a gallon, but prices for the most part are not notably higher than they are in America; the major economic difference is the salary scale, about two-thirds lower in Israel.

Israelis work a six-day 45-hour week, and the work day begins at eight A.M. Consequently people tend to rise and retire earlier and usually have their largest meal in the afternoon. Entertaining is generally done over coffee in the late afternoon; dinner parties and restaurant dining are not common. Since entertaining is less formal there is more of it, and the Gordons find the mix of backgrounds makes social life in Israel very stimulating. The cultural and intellectual life can be stimulating as well, with a variety of musical events, theatre and lectures from which to choose. Dr. Gordon notes that, "Country clubs are unheard of in Israel. There is one golf course, but it is only a golf course." Tennis and soccer are the most popular Israeli sports, and the Gordons find that there are always opportunities for new aesthetic and spiritual experiences.

Perhaps the greatest change for Dr. Gordon has been occupational. Previously a full-time practitioner of internal medicine, Dr. Gordon went to Israel with no intention to retire but with no specific job situation in mind. He is now Civil Air Surgeon for the State of Israel thanks to a lifelong avocational interest in aviation medicine. Himself licensed as a commercial pilot and an instrument instructor, Dr. Gordon logged 4500 hours of flying time while in private
practice, including flights to various parts of the United States, Mexico and Canada. He had also served for 20 years as senior Flight Examiner for the Federal Aviation Administration and had been trained in accident investigation. His new job encompasses these areas but includes others as well. Naturally there is a good deal of administrative detail with which to contend, and he coordinates a team of specialists from many fields in dealing with problems of passenger transport, health and standards for air crew and ground support people.

Dr. Gordon is on boards of enquiry for all aviation accidents, investigating the human factors involved such as fatigue, emotional stress, extreme heat, etc. His internal medicine background and his own flight experience are useful in evaluating grounding situations for pilots and air crews under most medical conditions. He is also concerned with agricultural aviation, enforcing safety and flight time regulations for those involved in spraying agricultural chemicals.

“The pilots think they’re indestructible, and it isn’t easy to make them understand what these chemicals can do to them.” Working with engineers regarding use of oxygen at 40,000 feet plus altitudes and the effects of pressurization loss is another responsibility of the Civil Air Surgeon.

In Dr. Gordon’s opinion, there is a great deal of interest in medical research and medical problems in Israel, but not as much in the patient himself. Medicine is socialized to a great extent, with virtually no private practice as we know it: people simply cannot afford it. Depending on one’s willingness and ability to pay, different medical plans are available, some allowing the right to choose one’s own physician, some using only clinic physicians with considerable waiting time the rule. The quality of care is excellent, with all modern methods available and freely used. “Medical men read a great deal,” Dr. Gordon notes, “and many belong to journal clubs to keep current of medical advances.”

Within three years the Gordons, as Jews, will be granted Israeli citizenship under the “Law of Return.” Since this process is automatic, their U.S. citizenship can be simultaneously retained. Each year they spend a month in the U.S. visiting family and friends, and their options are open if they decide not to make the move a permanent one. Dr. Gordon notes that most people who leave Israel do so for economic rather than security reasons. If people make less of the danger than might be expected it is perhaps because most of those now living in Israel either were born there or have immigrated from countries in which they could not live freely as Jews. “People like us from the free world,” says Dr. Gordon, “have a choice. But most Israelis come to accept danger as a part of life, because they have no choice. There is nowhere else to go.”

| 1968 |
| Dr. Joel M. Barish, 1988 Calle Madrigal, La Jolla, Ca., is practicing gastroenterology in San Diego and his wife is practicing pediatrics. They have a son, Doug, age two. |
| Dr. Wayne H. Braverman, 44 Tradd St., Charleston, S.C., writes that Lana and he are happily enjoying life in Charleston where he practices psychiatry. He is now a Diplomate of the Boards of Psychiatry and Neurology. |
| Dr. Clifford A. Gordon, 1777 Hamburg Tpke., Wayne, N.J., is practicing gastroenterology. He has two daughters and a new son. |
| Dr. Robert A. Jacobs, 2615 N. Vermont Ave., Los Angeles, is an Assistant Professor of Pediatrics at the USC School of Medicine. He is also working at Children’s Hospital in Los Angeles. |
| Dr. Joel A. Kaplan, 1175 Gunison Ct., Clarkston, Ga., has been appointed Director of Cardiothoracic Anesthesia at Emory University Hospital in Atlanta. |
| Dr. Martina Mockaitis Martin, 17 Dartmouth L., Haverford, Pa., was certified by the American Board of Internal Medicine in rheumatology in 1974. |
| Dr. Morris L. Orocofsky has been appointed staff internist for the Philadelphia Psychiatry Center. Dr. Orocofsky is a Diplomate of the American Board of Internal Medicine. He finished his medical residency in June, 1975. |

| 1969 |
| Dr. Robert L. Arkus, 5600 S. Willow Dr., Ste. 116, Houston, is practicing internal medicine and gastroenterology at the above address. He and his wife adopted two children while in the Air Force in New Mexico, Lisa and Rebecca. |
| Dr. Richard C. Gross, 4301 26th St., San Francisco, is in his final year of residency in diagnostic radiology at the University of California, San Francisco Medical School and will remain there next year on the junior staff. His wife, Carrol, has received her Masters degree in Nursing from the UCSF and is now an Associate Professor of Nursing at San Francisco State University. |
| Dr. Barry S. Smith, 702 Lexington Pl., Louisville, Ky., passed his specialty boards and is now certified by the American Board of Physical Medicine and Rehabilitation. |

| 1970 |
| Dr. John A. Azzato has been appointed to the staff of the Orthopaedic Surgery Department at Methodist Hospital. He served |
orthopaedic residencies at the University of Illinois and Jefferson.

Dr. Edward B. Bower, 3 McIntosh Pl., Ft. Stewart, Ga., completed his general surgery residency at Jefferson and is now a surgeon in the Army for two years. He and his wife and their two children are living on post at Ft. Stewart. Before leaving Philadelphia, Dr. Bower had a one-man art exhibition and reception in the Jefferson Commons Gallery.

Dr. Larry S. Cohen, 16800 N.W. 2 Ave., Ste. 204, N. Miami Beach, Fl., announces Dr. Edward B. Bower, 3 McIntosh Pl., Ft. Lauderdale, Fl., has joined Medical Associates of South Florida. Dr. Larry S. Cohen, 16800 N.W. 2 Ave., Ft. Lauderdale, Fl., announces that Dr. Edward B. Bower, 3 McIntosh Pl., Ft. Lauderdale, Fl., had a one-man art exhibition and reception in the Jefferson Commons Gallery.

Dr. Douglass B. Hagen, 1370 Byron Dr., Salinas, Ca., has joined Medical Associates of South Florida. Dr. Douglass B. Hagen, 1370 Byron Dr., Salinas, Ca., has joined Medical Associates of South Florida.

Dr. Steven A. Klein, 8916 Data Point Dr., San Antonio, Tx., graduated from anesthesiology residency in North Miami Beach.

Dr. Robert M. Lumish, 7106 S.W. 112th Pl., Miami, finished a general surgery residency at Albert Einstein College Hospital, Yeshiva University, in June and enters the Air Force in July.

Dr. James R. LaMorgese, 1960 Williamsbridge Rd., Bronx, N.Y., and his wife, Nancy, announce the birth of a son, Robert Scott, February 9. They have two other sons, James, III and Brad. Dr. LaMorgese will complete his residency in neurosurgery at Albert Einstein College Hospital, Yeshiva University, in June and enters the Air Force in July.

Dr. Paul M. Fernhoff, 2592 Briarcliff Rd., N.E., Atlanta, and his wife, Deborah, announce the birth of a daughter, Shana Mirem, on May 31, 1975.

Dr. Bruce M. Fishbane, 21 Strabane Ct., Baltimore, will be Chief Resident in orthopaedic surgery at Johns Hopkins. His wife, Marsha '72, is on the full-time clinical staff at Johns Hopkins after finishing her pediatric training there. She is also a part-time student at their School of Public Health and Hygiene. Their daughter, Alissa Michele, was born on June 24, 1975.

Dr. William C. Hamilton, 23 E. Homestead Ave., Collingswood, N.J., is a senior orthopaedic resident at Jefferson and expects to enter the service in July, 1976. His second daughter, Amy, was born in August, 1975.

Dr. David W. Jones, P.O. Box 4523, Boulder, Co., has been appointed Director of Emergency Services at Boulder Community Hospital.

Dr. Barry R. Klein has completed his residency in emergency medicine at the University of Louisville and is now Director of Emergency Services at Parkridge Hospital and President of Emergency Medical Associates, Chattanooga, Tennessee.

Dr. Gerald M. Klein, U.S. Naval Hospital, Box 19, F.P.O., New York, passed his Boards in Radiology in June 1975 and is now serving a two-year tour in the U.S. Navy as Chief of Radiology at the Navy Medical Center in Naples, Italy.

Dr. Michael J. Lechman, 519 Montgomery Ave., A202, Bryn Mawr, Pa., is in his second year of surgical residency at Bryn Mawr Hospital.

Dr. Elizabeth London Rogers, 1904 Elmore St., Louisville, Ky., is Assistant Professor of Medicine at the University of Louisville Medical Center, while her husband “is protecting our country at Fort Knox. Our son, Bradley, is a healthy, happy 13 months of joy.”

Dr. Edward B. Ruby, 468 W. Chocolate Ave., Hershey, Pa., announces the birth of a baby girl, Alisa Melane, on July 25, 1975. He is doing a Fellowship in endocrinology at Hershey Medical Center.

Dr. Augustin J. Schwartz III, 705 N. Olive Ave., P.O. Box 3167, W. Palm Beach, Fl., has become a Diplomate of the American Board of Medical Oncology and a Board certified medical oncologist. He invites his classmates to visit if they are in the Palm Beach area.

Dr. Stephen C. Silver, 4082 Wilmington Rd., S. Euclid, Oh., has returned to the Cleveland Clinic as a senior resident in general surgery after two years as a general surgeon in the Air Force. He plans to finish in general surgery in 1977 and take a Fellowship in colon and rectal surgery. “Looking forward to our reunion.”

Dr. J. Stanley Smith, Jr., 1139 Loop Dr., Harrisburg, Pa., finished a general surgery residency at the Harrisburg Polyclinic Hospital and is now doing a Fellowship in trauma at the Maryland Institute for Emergency Medicine.

Dr. G. Thomas Spigel, 1424 10th Ave., S.E., Apt. 2, Rochester, Mi., married Cecelia M. Mulone on September 13, 1975. “Jim McBride ’71 and Hank Feder ’71 were among the ushers. I started a dermatology residency at the Mayo Clinic on October 1, and my wife, who is an R.N., started work at St. Mary’s Hospital.”

Dr. James O. Van Bavel, 53 Westmoreland Ave., Longmeadow, Ma., is Director of the Psychiatric Inpatient Unit at the Medical Center of Western Massachusetts in Springfield.
An Emergency Room Has No Appointment Book

Dr. Susan J. Syrek '68, an emergency room physician at Bryn Mawr Hospital, says that contrary to the television image of the accident ward, ER medicine today often is like a big general practice. "Of course we do get household and auto accident victims and many true medical emergencies, but we are more likely to treat cut fingers, sprains, belly and chest pains, many chronic conditions. We even had someone come in last week who wanted his ears irrigated."

After a residency in internal medicine at Bryn Mawr, Dr. Syrek's accident ward training was at Doylestown Hospital, where physicians were more likely to see a patient who had caught his hand in a thresher than one with a sprained hip. Still, some of the problems of emergency room work are constants. "It is difficult," Dr. Syrek notes, "to establish any rapport with the patient on a one-time visit. We have little background information and less follow-up. This same distance is evident in our relationship with the patients' families. It's a problem in treating patients and it has overtones for our malpractice vulnerability. If there is some personal connection between doctor and patient, a malpractice suit is less likely to seem attractive."

Because an emergency room has no appointment book, patient volume can at times be virtually unmanageable. Dr. Syrek finds that from May to October is her busiest time, positing that the longer hours of daylight give people more of a chance "to destroy themselves." Bryn Mawr saw 24,000 emergency patients last year, with a staff of four fulltime physicians and residents. The four fulltime staffers rotate, with each of three covering an eight-hour shift for a week and the fourth with a week off. This puts much responsibility on the one nonresident physician in attendance, and when there is a 20-patient backlog it can be a stressful, highly pressured position.

This pressure situation makes the accident ward physician especially vulnerable to criticism by referral physicians and the rest of the staff. Dr. Syrek feels they are often judged from an unfair perspective, because the referral doctor has not seen the precise condition that the emergency room physician had to treat on the spot.

For a person who can face stress without getting flustered, however, ER work has some notable advantages as well. Mentioned first is that, unlike private practice there is no administration, and an eight-hour day is guaranteed. Although the group at Bryn Mawr changes shifts weekly, so that each physician will work seven days of each eight-hour shift every month, once one adjusts to the schedule that full week off each month becomes a distinct benefit. Dr. Syrek usually insists that at least two days of that week are hers entirely, and often goes to New York for the opera she so much enjoys.

The greatest satisfactions of her work, however, are those occasional chance opportunities for follow-up, such as with patients whom she has treated previously who return for another reason. "When someone remembers us and lets us know that our treatment was successful, that everything turned out well, it is extremely rewarding."

Although the standardized hours of an emergency room position would seem to make it a likely professional choice for a woman with a family, Dr. Syrek notes that in this area few women have entered the field. As a mother of four herself, she feels that her career obligations have made her children very independent. "Since our first child was born when I was in college and the second the week before sophomore National Boards in medical school, none of the children has ever known any other way of life."

A Board-certified internist, Dr. Syrek feels that in her particular circumstance, where she refers a great many of her patients to specialists on the Hospital staff, her training in internal medicine, which gave her a broad background, is probably more valuable than a residency in the new emergency medicine specialty would have been. She believes, however, that the advent of the ER specialty will inevitably improve the quality of emergency care.

"While the emergency room is an excellent educational experience in everyday medicine for medical students and residents alike, too often lack of staffing puts the residents in virtual command of the accident ward. The ER specialty should make this work more attractive and bring more full-time physicians into service."
1972

Dr. William H. Brubaker, Camp Casey, Korea, APO San Francisco, completed his internal medicine residency at Presbyterian Medical Center in Denver. After he finishes his tour of duty with the army he plans to return to Denver to practice internal medicine.

Dr. Anna M. D’Amico, 2223 E. Prior Rd., Wilmington, De., has completed a residency in obstetrics and gynecology at the Wilmington Medical Center and will begin private practice in Wilmington.

Dr. Anthony P. DeNoia, 20 Avenue at the Common, Shrewsbury, N.J., passed his internal medicine Boards in June, 1975 and is now practicing internal medicine. He and his wife, Marianne, have a son, Christopher, one and one-half.

Dr. Philip J. DiGiacomo, Jr., 513 Paddock Rd., Havertown, Pa., writes that his first child, Heather, was born July 14, 1975. His wife, Anita, received her B.A. in psychology from Villanova two weeks before Heather’s birth.

Dr. Gregory J. Edinger, 115 Craven Dr., Havlock, N.C., is serving two years with the Navy at Cherry Point, North Carolina after completing a family practice residency at Wilmington Medical Center.

Dr. Richard L. Fieo, 825 Windermere Ave., Drexel Hill, Pa., writes of the birth of a daughter, Megan Ann, on November 5, 1975.

Dr. Marsha J. Fishbane, 21 Strabane Ct., Baltimore, finished her pediatric training at Johns Hopkins and is on the fulltime clinic staff there. She is also a parttime student at their School of Public Health and Hygiene. Her husband Bruce ’71 will be Chief Resident in orthopaedic surgery at Johns Hopkins in July. Their daughter, Alissa Michele, was born on June 24, 1975.

Dr. Sanford Fitzig, Thomas Jefferson Hospital, Department of Urology, and his wife, Elly, announce the birth of a daughter, Devon Meredith, born at Jefferson Hospital August 22, 1975. He is a second-year urology resident at Jefferson and will join the Air Force after completing his training next year.

Dr. Gene H. Ginsberg, 1735A Clarion Lp., Cannon AFB, Clovis, N.M., is spending two years in the Air Force in internal medicine. He and his wife were expecting their second child in March.

Dr. Charles A. Gordon, 51C Glen Mead Dr., Portsmouth, R.I., passed his Boards in internal medicine in 1975 and is now at the U.S. Naval Regional Medical Center in Portsmouth.

Dr. James T. Hay, 14202 Recuerdo Dr., DelMar, Ca., writes that he finished a family practice residency in July. He will be on the staff of the Naval Hospital at Camp Pendleton for the next three years, and has bought a new house in DelMar.

Dr. Philip C. Hoffman, 1468-D, Druid Valley Dr., Atlanta, is spending a U.S. Public Health Service commission in hospital epidemiology at the Bureau of Epidemiology, Center for Disease Control, Atlanta.

Dr. David P. Hughes, 16 Williamsbur Manor, Edwards Rd., Greenville, S.C., writes that his wife and son, John, are spending a year in Greenville as part of his orthopaedic residency at Duke University.

Dr. Stanley R. Jacobs, 1321 Wingholz St., Philadelphia, is coming on staff at Jefferson as an Instructor in rehabilitation medicine.

Dr. Gail Tenikat Jacoby, 66 Corwin St., Apt. 20, San Francisco, writes that her daughter, Suzanne Nichole Tenikat, was born September 25. “She and our residencies have kept David and me quite busy. When our residencies are completed in June, we plan to move to Belmont, California, and will be practicing on the peninsula, David, in internal medicine and I, in dermatology.”

Dr. Mark Josephs is running an emergency room in Merced, California, near Yosemite National Park.

Dr. Susan C. Judson, R.D. 3, Box 159, Williamsport, Pa., is Boarded in internal medicine and currently is completing a two-year hematology Fellowship at Geisinger Medical Center.

Dr. Alex B. Juhasz, 93 Brightwood Ave., Pittsburgh, is a third year resident in general surgery at Mercy Hospital in Pittsburgh.

Dr. Myles K. Krieger, 747 NE 61st St., Apt. 101, Miami, will complete an otolaryngology residency at Jackson Memorial Hospital of the University of Miami in June, 1977.

Dr. Helen A. Leibowitz, 1206 Rodman St., Philadelphia, is a second-year radiology resident at Pennsylvania Hospital. Her husband, Paul Hoyer, graduates from Jefferson this June.

Dr. Charles J. Locke, 465 N. Harlem Ave., Oak Park, Ill., is a third-year surgical resident at Cook County Hospital.

Dr. Robert D. McKay has completed his graduate medical training at the Mayo Graduate School of Medicine and presently is at the Naval Hospital in Bethesda, Maryland.

Dr. Rosalie K. Marinari, 149 Briar Ct., Marlton, N.J., is finishing a dermatology residency at Hahnemann in June, 1978. She will then enter private practice in Cherry Hill with another physician.

Dr. Carol A. T. Rivera, Edificio Oliver #308, Arecibo, P.R., passed her Boards in internal medicine. She continues in private practice in Arecibo.

Dr. James R. Roberts, 85 Bedford St., Forty Fort, Pa., is finishing a residency in emergency medicine at the Medical College of Pennsylvania in June. He will take a three-month trip to Central America by truck this summer.

Dr. Anthony R. Rooklin, 506 Vallejo St., #23, San Francisco, finished his pediatrics residency as Chief Resident at Oakland Children’s Hospital in June, 1975. He is now studying for a Master’s degree in public health and will return to Jefferson to begin a Fellowship with Dr. Herbert C. Mansman ’51 in pediatric allergy and immunology.

Dr. Michael S. Roth, 9845 Wisteria St., Philadelphia, is Chief Resident in ob-gyn at Temple University Health Sciences Center. He will begin a two-year Fellowship in reproductive endocrinology at the University of Miami in July, 1976.

Dr. Marshall A. Salkin, Key West Naval Hospital, Key West, Fl., is on the staff of the above hospital in internal medicine.

Dr. Bruce S. Saltzman, 7860 S.W. 147th St., Miami, is practicing anesthesia at Doctor’s Hospital in Coral Gables. He and his wife have one daughter, Stephanie, two.

Dr. Barton L. Schneyer, 212 Brookley Ct., Loring AFB, Me., has completed an internal medicine residency at Montefiore Hospital in the Bronx and he and his wife Elin (“and assorted pets”) will be at Loring AFB until July, 1977.

Dr. Susan E. Saniels, 1333 Old Gulph Rd., Villanova, Pa., is completing a Chief Medical residency at Jefferson and will begin a Fellowship at Cardeza in July.

Dr. Thaddeus R. Szydlowski, 885 Easton Rd., Glenside, Pa., and his wife had a daughter, Kristen Ann, on August 19, 1975. He is doing a hematology Fellowship at the New Jersey College of Medicine and Dentistry. In July he will begin a gastroenterology Fellowship at Lankenau.

Dr. William M. Wixted, 604 Meadow Rd., Pine Hill, N.J., writes that he and his wife, Jean, now have two sons with the arrival of Thomas in December, 1975.

1973

Dr. John W. Cochran, 1718 W. Flournoy St., Chicago, completed his internal medicine residency at Presbyterian-St. Luke’s Hospital and began a neurology residency there. His wife, Arlene, will receive her Master’s degree in special education from the University of Illinois in March.
Dr. Joseph A. Jacobs, 6902 Bonnie Ridge Dr., Baltimore, is doing a urology residency at the University of Maryland. He was married in August, 1975 to Linda Anne Gazzetti, who is getting her M.S. at the University of Maryland in community health nursing.

1974

Dr. Louis T. Broad, 2991 School House La., Oak 14E, Philadelphia, "who has been happily married to the former Andrea Rosenthal since April, 1975, is proud to announce that he has no children or pets."

Dr. Joel M. Brown, Methodist Hospital of Dallas, Dallas, is in the second year of a medical residency at the above hospital. He has a daughter, Jennifer, age one, and is buying their first house in Mesquite, Texas.

Dr. John J. Karlavage, 1417 A Confederate Ave., Columbia, S.C., has co-authored a paper on methylphenidate and Gille de la Tourette's disease that will be published by the Journal of the Academy of Child Psychiatry. He has also been accepted by the University of Chicago for a psychosomatic medicine elective in 1977.

Dr. Scott I. Lampert, 2485 Morosgo Pl., Atlanta, Ga., will begin an ophthalmology residency at Jefferson in July, 1976.

Dr. Anthony D. Molinaro, Jr., 1927 Queenswood Dr., York, Pa., is happily married and in the middle of a three-year family practice residency at York Hospital.

Dr. Martin D. Mollen, 8572 E E. Indian School Rd., Scottsdale, Az., is presently in his second year of postgraduate training in internal medicine at the Good Samaritan Hospital of Phoenix, Arizona. He and his wife Joan proudly announce the birth of their first child, Rochelle Ilona, on August 18, 1975. "Also of note, is that Marty became interested in jogging since in Arizona, and ran his first marathon, 26 miles, 385 yards on December 20, 1975 in the Fiesta Bowl Marathon in Phoenix. He plans to be the first physician from Arizona to run in the Boston Marathon this spring."

Dr. John P. Morton, 624 7th St., Imperial Beach, Ca., is practicing family medicine at the above address, and announces the birth of a son, Hank, who is now 15 months old.

Dr. James D. Plumb, 1018 Spruce St., Philadelphia, is a second-year resident in Jefferson's Department of Family Medicine.

Dr. Jay S. Schinfeld, 474 W. 238th St., Apt. 2F, Riverdale, N.Y., is a second-year resident at Albert Einstein College of Medicine. His wife, a recent graduate of Columbia School of Public Health, works for Planned Parenthood.

Obituaries

George F. Lull, 1909
Died February 7, 1976 at the age of 88. Dr. Lull attained the rank of major general in the United States Army and from 1943 to 1946 served as Deputy Surgeon General. He was Secretary General Manager of the American Medical Association. In addition Dr. Lull served as Medical Director of Cook County Department of Public Health, President and Executive Administrator of the Illinois State Medical Society and Vice-President of the Chicago Medical Society from 1970 to 1976. Dr. Lull held a Master's degree from Harvard University and a Doctor of Public Health from the University of Pennsylvania. Surviving are his wife, Mildred, and a son, Dr. Lull, Jr., '40.

Herbert C. Oelschlegel, 1911
Died July 21, 1975 at the age of 88. Dr. Oelschlegel, a family practitioner, resided in Torrington, Connecticut. He was a past President of the Torrington Medical Association.

Enrique G. Matta, 1912
Died October 29, 1975 at the age of 90. Dr. Matta served as a Municipal doctor in Puerto Rico for 34 years. In the early years of his career he was elected Mayor of his village, a Senator in the Puerto Rico Senate and a Trustee at the University of Puerto Rico. He retired in 1944 and devoted his time to his 538 acre coffee plantation and writing. His son, Dr. Enrique, Jr., graduated from Jefferson in 1940.

James R. Reuling, 1914
Died December 27, 1975 in Windermere, Florida where he had been residing for the past 18 years. Prior to his move he was an internist in Bayside, New York. In 1953 Dr. Reuling was awarded the Will Ross Medal by the National Tuberculosis Association for his work in fighting the disease. He was President of the Queensboro TB and Health Association and served as President of the national organization in 1947. He also is a past President of the Queens County Medical Association. Surviving are his widow, Roberta, and two daughters.

Sheldon A. Saunders, 1914
Died April 7, 1975 at the age of 88. Dr. Saunders was a family practitioner residing in Aulander, North Carolina.

Holbert J. Nixon, 1914
Died December, 1975 at the age of 85. Dr. Nixon, an obstetrician, practiced in Uniontown, Pennsylvania for 50 years. He served as Chief of the Department at Uniontown Hospital.

Alexis T. Mays, 1915
Died February 17, 1976. Dr. Mays, a cardiologist, resided in Brooklyn with his wife, who survives him.

Horace B. Anderson, 1917
Died January 29, 1976 at the age of 85 in Delray Beach, Florida. Dr. Anderson specialized in cardiology and pathology in Johnstown, Pennsylvania. He served as both Medical Director and President of the Staff of Memorial Hospital there.

Isidor Hendel, 1917
Died May 14, 1975 at the age of 79. He was a family practitioner who resided in New London, Connecticut.

William B. Fort, 1918
Died November 19, 1975 in Pompano Beach, Florida, where he resided since his retirement in 1959. Dr. Fort was a gynecologist in Plainfield, New Jersey and was senior staff member in that Department at Muhlenberg Hospital. He had served as President of the Plainfield Board of Health and the Plainfield Medical Society. Surviving are his widow, Marion, a son, a daughter and two stepdaughters.

John M. Tyson, 1918
Died October 10, 1975 at the age of 81. Dr. Tyson was an otolaryngologist who resided in Dubois, Pennsylvania.

Francis C. Hartung, 1919
Died June 30, 1975 at the age of 88. He was a general practitioner in the Philadelphia area.

Ira H. Hurt, 1919
Died February 7, 1975 at the age of 84. A general practitioner in Roanoke, Virginia, Dr. Hurt also served as a Director of the Shenandoah Hospital for 20
years. He is survived by his wife, Edith, a daughter, Phyllis, and a son, Ira, Jr.

Paul A. Bishop, 1920
Died January 6, 1976 at the age of 79. Dr. Bishop, Professor of Radiology at the University of Pennsylvania School of Medicine and its Graduate School of Medicine, had served as Director of the Department of Radiology at Pennsylvania Hospital until his retirement in 1962. He served as President of the Staff from 1951 to 1953. Dr. Bishop was a Diplomate of the American Board of Radiology, a former President and Treasurer of the Philadelphia Roentgen Ray Society and a Vice-President of the American Roentgen Ray Society. He was the author of a book and numerous papers on radiological diagnoses. Dr. Bishop also served as Secretary of the Philadelphia Lyric Opera Company. Surviving is his wife, Ruth.

Lewis G. Woodson, Jr., 1920
Died May 25, 1975. Dr. Woodson was an internist who resided in Birmingham, Alabama.

Wesley S. Miller, 1922
Died June 3, 1975 at the age of 78. Dr. Miller was a family practitioner in Jeannette, Pennsylvania.

Maurice Saltzman, 1922
Died February 1, 1976 at the age of 81. Dr. Saltzman was an ear, nose and throat specialist with offices in Philadelphia. He is survived by his wife, Sophie, and two sons, Dr. Edward J. Saltzman '49 and Dr. Herbert A. Saltzman '52.

Herman H. Hostetter, 1923
Died December 6, 1975 at the age of 81. Dr. Hostetter served as personal physician to Milton S. Hershey for many years and was school physician for the Milton Hershey and Derry Township School systems. A charter member of the Keystone Area Council of the Boy Scouts of America he had received outstanding service awards from the Hershey Rotary Club and Lions Club. Surviving are his wife, Sayra, a son, Dr. Glenn H. Hostetter '60, and a daughter, Joanne.

Alfred H. Diebel, 1925
Died February 7, 1976 in Fort Lauderdale where he had been residing since his retirement. Dr. Diebel, an obstetrician gynecologist in the Philadelphia area, was a member of the American College of Surgeons and the American College of Obstetricians and Gynecologists. His wife, Amanda, survives him.

Roy E. Nicodemus, 1927
Died January 3, 1976 at the age of 72. Dr. Nicodemus served as Director of the Department of Obstetrics and Gynecology at Geisinger Medical Center from 1930 to his retirement in 1965. He was a Fellow of the American College of Surgeons, a Diplomate of the American Board of Obstetrics and Gynecology and a founding Fellow of the American College of Obstetricians and Gynecologists. At Bucknell, his undergraduate school, he was President of the Alumni Association and a member of the Board of Trustees. Surviving are his wife, Geraldine, a son and three daughters.

Marshall Kerry, 1929
Died December 11, 1975 at the age of 77. Dr. Kerry was an anesthesiologist at the Reading Hospital at Reading, Pennsylvania from 1950 to 1970. He also served as Director of the Department there. He is survived by his wife.

Russell W. Rummell, 1929
Died October 7, 1975 at the age of 72. Dr. Rummell served as Medical Director of the Youngstown (Ohio) Hospital Association from 1948 to his retirement in 1966. He was a member of the American College of Hospital Administrators.

David B. Karr, 1930

Joseph M. Brown, 1933
Died January 16, 1976. Dr. Brown was a general practitioner in Santa Rosa, California.

David O. Helms, 1936
Died December 30, 1975 at the age of 67. Dr. Helms, a general practitioner, resided in Bethlehem, Pennsylvania. Surviving are his widow, Gertrude, and two sons and a daughter.

Lindon L. Davis, 1937
Died November 29, 1975. Dr. Davis practiced internal medicine in the East Williston area of New York.

Richard H. Fenstermacher, 1937
Died January 7, 1976 at the age of 63. Dr. Fenstermacher was Director of Pathology at the Street Clinic in Vicksburg, Mississippi. He is survived by his wife, Mary, and a son.

Albertus C. Wyker, 1940
Died November 25, 1975. Dr. Wyker was a general surgeon practicing in Pleasantville, Ohio.

John J. Wydzynski, 1945
Died February 19, 1976 at the age of 56. Dr. Wydzynski, a general practitioner, served on the staffs at Mercy Catholic Medical Center and Delaware County Memorial Hospital. He is survived by his wife, Valeria, and three sons.

Joseph F. Devenn, 1946
Died January 24, 1976 at the age of 55. Dr. Devenn, a resident of Newtown Square, Pennsylvania, was an obstetrician/gynecologist and served on the staffs of Fitzgerald Mercy and Riddle Memorial Hospitals. He was a Clinical Instructor at Jefferson. Surviving are his wife, Mary Catherine, a son and daughter.

David D. Biser, 1949
Died December 28, 1975 at the age of 52. Dr. Biser was a psychiatrist/neurologist who worked primarily with children at the Children's Rehabilitation Center at St. Agnes Hospital and the Mental Retardation Institute of New York Medical College. He was a resident of Croton-on-Hudson, New York.

Joseph B. Shaw, 1960
Died May 1, 1975 at the age of 41 in an accident. Dr. Shaw was the psychiatrist for the Department of Correction in Reading, Vermont, and also maintained a private practice. He is survived by his wife, Gretchen, and three children.
Edward L. Bauer, M.D.
1891-1976

Dr. Edward L. Bauer, Emeritus Professor of Pediatrics, died on February 13 at the age of 85. He had served as Chairman of that department from 1926 until his retirement in 1961. It was Dr. Bauer who introduced modern methods of diphtheria prevention to the Philadelphia area and who served as immunologist for the city, beginning with an appointment to the Department of Public Health in 1918. During his 14 years as Chief Immunologist, he virtually eliminated outbreaks of diphtheria which at that time was a dreaded and sometimes fatal disease.

Dr. Bauer's contributions to medical literature comprise some 300 articles on children's and communicable diseases as well as several important contributions to medical textbooks. Through his writings he contributed greatly to preventive pediatrics which was a relatively new concept at the time of their publication. Dr. Bauer also was the author of the Jefferson history "Doctors Made in America."

The Professor had served on the state's Certified Milk Commission for 25 years and was Director of Health Services at Girard College for nearly the same length of time.

He served as consulting pediatrician to Philadelphia General, Germantown, St. Christopher's and Memorial Hospitals and the Children's Seashore House in Atlantic City. Dr. Bauer was a Fellow of the American Academy of Pediatrics and the College of Physicians of Philadelphia, a past President of the Philadelphia Pediatric Society and a past Chairman of the Pediatric Section of the Pennsylvania Medical Society.

His son, Dr. Richard D. Bauer, '45, represents the eighth generation of physicians in the family, four generations of whom are graduates of Jefferson Medical College. He served the Alumni Association as President in 1941.

Paul D. Zimskind, M.D., Ph.D.
1932-1976

Dr. Paul D. Zimskind, one of the youngest men ever to head a medical department at Jefferson Medical College, died Sunday, February 29 after a sudden illness.

Dr. Zimskind, age 44, had been appointed the Nathan Lewis Hatfield Professor of Urology and Chairman of the Department in 1967. His teaching career began in 1964 when he became Assistant Professor of Urology.

A magna cum laude graduate of Princeton University, he was named a Markle Scholar in Academic Medicine in 1966. He received his Doctor of Medicine degree from Jefferson in 1957 and a Doctor of Philosophy degree in physiology in 1964.

Several years before his appointment as Chairman, he wrote to his colleagues, in part: "I continue to derive enormous satisfaction from planning and carrying out research and stimulating and encouraging the research efforts of others. I intend to continue in research and teaching both for the enjoyment they afford and because the exclusion of either would not fulfill my goal of a true academic career."

Dr. Zimskind was a member of approximately 20 professional societies, including the American Association of Genito-Urinary Surgeons, the American Association for the Advancement of Science, the National Research Council and the American Urological Association. He was the author of 43 scientific papers and 77 presentations throughout the world.

His honors included the Francis W. Shain Surgery Prize while a student at Jefferson and First Prize, Basic Research Essay Competition, given by the Philadelphia Urological Society in 1961.

Dr. Zimskind is survived by his wife, the former Gay Mann; a son, Jeffrey, age 13; and a daughter, Wendy, age 9. They live in Penn Valley.

He is also survived by his brother, Nathaniel H. Zimskind, a Rabbi; his father, Dr. Joshua N. Zimskind, a 1927 graduate of Jefferson; and his mother, Sadie.
Dr. Peter A. Herbut at his May, 1967 inauguration at the Academy of Music
Peter Andrew Herbut, M.D., C.M.
1913-1976

In the summer of 1939 there came to Jefferson a young Canadian physician, graduate of McGill, to complete his training in pathology under Virgil Moon. The following year he was appointed Assistant Director of the Clinical Laboratories. Before a decade had passed, he was Professor and Chairman of the Department, uniting under one head the divisions in the Medical College and Hospital. It was a remarkable achievement, but Peter Andrew Herbut was an extraordinary man. And bigger things were yet to come.

Like he worked he supervised, rigorously and almost all the time. The department showed improvement from the start despite the fact that the budget was meager and the space very cramped. A complete residency program was organized. Those of us who were trained under his tutelage think back fondly of that time and recollect many amusing incidents related to long hours of hard work, immediate deadlines, careful photographing of specimens and vacations that would end barely after their start. Tardiness and procrastination were deeply frowned upon. Excellence and dedication were acknowledged quietly, perhaps with a careful smile as a reward, but he would not forget to say many nice things about you behind your back. We recall how intense was his love for music, particularly for Mozart. Among the things he planned for the years of retirement were writing essays on composers and a definitive history of Jefferson. He was a fan of sports. The Phillies and the Flyers of Philadelphia were his special love, and he followed their games closely and with characteristic enthusiasm. And we remember best of all how charming were the visits to his home and how deep was the love he shared with his wife Margaret, the sweet lady he married a year after he came to Jefferson, and with his daughters Linda and Paula. Years later, his former trainees remain strongly united by that experience, a bond that undoubtedly arose not merely as an Alma Mater tie but from the power and magnetism of the man.

He lectured regularly to sophomores, with sonorous voice and very, very well organized. Pathogenesis was clearly outlined, stepwise and invariably beginning with "number one." His voluminous textbook of general pathology was called "jolly green giant" by the class, and the students, sharp critics that they are, recognized and thanked the outstanding teacher by selecting him to membership in three of their societies, including Alpha Omega Alpha. In 1961 his portrait was painted upon the wish of the senior class. At the weekly clinicopathologic conference and Tumor Clinic, which were superb and eagerly awaited by the staff, he was a steady force because his knowledge of pathology was diffuse, his approach very practical and his powers of persuasion strong. During those years he wrote, longhand, scientific papers galore and gained national renown among his peers. The first paper in which he was a senior (and only) author was on diabetic glomerulosclerosis, a disorder originally described by Dr. Paul Kimmelstein, under whom Dr. Herbut had his first year of training in pathology. Most noteworthy were his contributions to the cytologic diagnosis of cancer, for which he received the Ward Burdick Award, the highest honor bestowed by the American Society of Clinical Pathologists. For a long time he was in the editorial Board of Acta Cytologica and consultant in pulmonary cytology to the International Academy of Gynecologic Cytology. His research on substances which inhibit tumor growth, begun some years later, also achieved widespread recognition. He wrote four textbooks virtually alone. The one on Urological Pathology, which was translated into Spanish, is still the only treatise on the subject. His reputation as an educator of uncommon skill and administrator par excellence led him to serve as advisor or consultant to a long list of organizations of sundry natures and intents, including the National Library of Medicine, the Council of Education of the Commonwealth of Pennsylvania, the Pennsylvania Society for Advancing Medical Research, and the National Association on Standard Medical Vocabulary. In 1970, Dr. Herbut was presented with the Shaffrey Award by the Medical Alumni of St. Joseph's College, and on that occasion he spoke on trends in medical education.

As a member of the Executive Faculty, of which he was Chairman for ten years, Dr. Herbut helped to formulate many of the plans from which emerged the remarkable changes that have taken place here over the last two decades. His participation was never casual for he was too much a man of vigorous determination and, above all, because he was completely Jefferson. Those qualities would bring him to the inner circles of action in planning and development and eventually to the Presidency of the institution. The organization of a College of Graduate Studies he supported strongly. His was one of the most compelling forces in the creation of the Jefferson-Penn State Program of accelerated medical education. He backed without equivocation the admission of female applicants to Jefferson Medical College. Far more than anyone else he promoted and brought to fruition the concept of a College of Allied Health Sciences, and through it university status for Jefferson. After that, he kindled the idea to set up graduate training in dental sciences and educational programs for dental technologists. And so he went, constantly seeking ways here and there to improve and expand the institution to which he gave unconditionally all the years of his fruitful life. The connections that we now have with the Franklin Institute and the Philadelphia College of Pharmacy are two more instances of his far-sighted drive. He lived to see the realization of yet another of his stout-hearted projects—the almost total replacement of our health care facilities by a $100,000,000 new Hospital-Clinical Teaching Facility. He was accessible to all the men and women in the University, at all levels, and invariably willing to lend an ear to our problems, suggestions or complaints. Having been first a member of the Faculty, he felt particularly close to its members during his years as President. We sensed that readily and appreciated it a lot. He was also close and accessible to alumni of Jefferson throughout the country and in distant lands. The Alumni Association also appreciated that a lot, and expressed its thanks by granting him honorary membership in 1974.

Nearly a decade of growth and development. Then, on the last afternoon of March 1976, suddenly and very unexpectedly Peter Herbut died. Oh, what a heavy loss for Jefferson! Whence will come such another leader? Forever and a day will live the memory of that man.

Gonzalo E. Aponte, M.D. '52