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The Rockefeller University

THE ROCKEFELLER UNIVERSITY

news and notes

JUNE — JULY 1983
VOLUME 14 NUMBER 5

20 Receive Ph.D. Degrees; Brink and Nathans Honored at 25th Commencement

President Lederberg presented the Ph.D. degree to 20 graduates at the University's 25th commencement convocation on June 8. He conferred honorary doctor of science degrees on Professor Emeritus Frank Brink, Jr., a distinguished biophysicist and the University's first dean of graduate studies, and Daniel Nathans of The Johns Hopkins School of Medicine, who won the Nobel Prize in 1978 for his work in molecular biology and genetics.

As is the University's custom, the proceedings were limited to talks by faculty presenters who explained the significance of the degree recipients' work to an audience of friends, families, and colleagues gathered in Caspary Auditorium. Dean Clarence M. Connelly opened the program and later presented Dr. Brink for his degree. Professor Norton D. Zinder presented Dr. Nathans. Professors Purnell W. Choppin and Attallah Kappas served as marshals, placing the University's blue-and-gold-trimmed hoods on the degree recipients. Dr. William O. Baker, chairman of the board of trustees, and David Rockefeller, chairman of the board's executive committee, were among the participants in the ceremonies.

This year marks the 30th anniversary of Frank Brink's association with Rockefeller. He came to the University with his longtime colleague, the late Detlev W. Bronk, who initiated the graduate program during his presidency, from 1953 to 1968. Dr. Brink served as dean until 1972. He was appointed Detlev W. Bronk Professor in 1974, holding the chair until he became emeritus in 1981.

A native of Pennsylvania, Dr. Brink earned his Ph.D. in 1939 at the University of Pennsylvania Johnson Research Foundation for Medical Physics, which Dr. Bronk then directed. In his research at the Johnson Foundation and later at Johns Hopkins and at Rockefeller, Dr. Brink studied the biophysics and biochemistry of neurons, particularly the processes of excitation, response, and recovery in nerve fibers. His laboratory contributed significant findings about the energy transformations involved in the electrochemical events that occur in the axons of nerve cells.

Daniel Nathans, a graduate of Washington University School of Medicine, has been at Johns Hopkins since 1962. He has directed the departments of microbiology and of molecular biology and genetics. He is currently professor of molecular biology and genetics and senior investigator of the Howard Hughes Medical Institute.

Dr. Nathans has won distinction for his studies of restriction enzymes, a special class of proteins which cut DNA at specific sites. Using these enzymes it has become possible for scientists to isolate and identify genes and recombine them. Dr. Nathans has applied this technique to genetic analysis, working primarily with tumor viruses. Before joining Johns Hopkins, he was a guest investigator in the Rockefeller laboratory of Professor

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Commencement, June 8. Seated, left to right: Purnell Choppin, David Rockefeller, Daniel Nathans, Norton Zinder, Joshua Lederberg, William O. Baker, Frank Brink, Clarence Connelly, Attallah Kappas. On the steps, Ph.D. recipients and their presenters.

Three Appointed VPs

Professors Purnell W. Choppin and Attallah Kappas and attorney William H. Griesar become University vice presidents on July 1, approved by the board of trustees at its May 19 meeting.

Dr. Choppin, Leon Hess Professor and co-head of a major laboratory in virology, assumes the post of vice president for academic programs. His duties embrace the graduate fellows program and selected postdoctoral activities. Dr. Kappas, Sherman Fairchild Professor and head of the metabolism-pharmacology laboratory, adds vice president to the title of physician-in-chief, which he has held since 1974.

Mr. Griesar comes to Rockefeller, as vice president and general counsel, from the New York firm of Rogers Hoge & Hills, which he joined in 1959 and where he has been a partner since 1966. In 1981 he represented the Hoechst Corporation in negotiations that established a new Department of Molecular Biology at Massachusetts General Hospital. He has served

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Albert Claude, father of modern cell biology, dies in Belgium. See story on page 7.

Seitz Receives Bush and Loveland Awards

President Emeritus Frederick Seitz received the Fourth Vannevar Bush Award presented by the National Science Board, the policy-making body of the National Science Foundation, at the board's annual dinner, held at the Department of State on May 18. The medal and citation honored his "pathfinding leadership" as a scientist and his "excellence as an educator and public servant."

On April 11, Dr. Seitz received the Edward R. Loveland Memorial Award for his "distinguished contribution in the health field," presented by the American College of Physicians at its annual meeting in San Francisco.

In his protean career, from his pioneering research in solid-state physics to his many years of service as teacher and administrator at this and other universities, and from his presidency of The National Academy of Sciences to his participation in scores of international and national councils, Dr. Seitz has represented the ideal of science in the public good.

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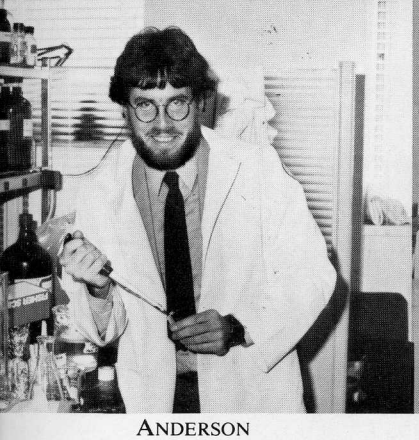
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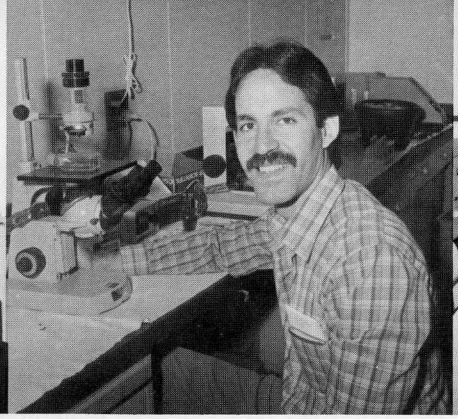
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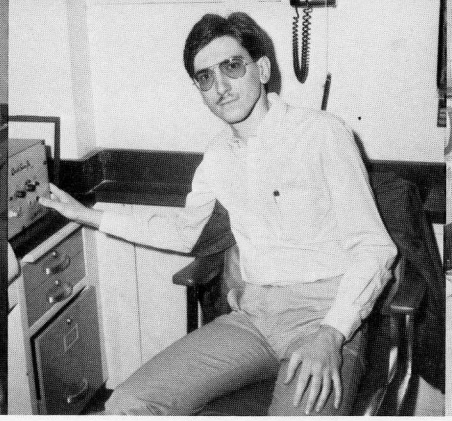
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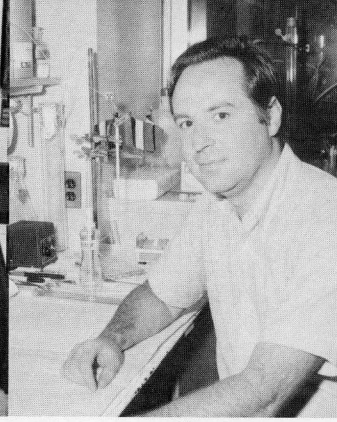
BERRIOS

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Emeritus Fritz Lipmann from 1959 to 1962.

Condensations of the presenters' remarks follow. The degree recipient's name appears first.

DAVID J. ANDERSON

Günter Blobel

David Anderson entered the Ph.D. program after graduating from Harvard summa cum laude. After a half-year rotation in Bernie Gilula's laboratory he joined our laboratory with his own ambitious ideas. Through ingenuity and hard work he succeeded not only in realizing his goals but went far beyond to establish some of the mechanisms by which biological membranes are put together. By cell-free translation and membrane integration experiments, he showed that the four nonidentical subunits of the acetylcholine receptor were synthesized individually and not as part of a polyprotein. Each of them is synthesized with a transient amino terminal signal sequence that is cleaved upon asymmetric integration of the polypeptide into microsomal membranes. Following integration into the microsomal membrane, the individual subunits persist as homo-oligomers before they are assembled into the hetero-oligomeric acetylcholine receptor at some later step. He also used monoclonal antibodies together with limited proteolysis to establish the topology of various domains of one of the subunits. He then investigated the mechanism of integration in detail. He demonstrated that the signal recognition particle (SRP) (recently discovered by Peter Walter in our laboratory) is required for integration. As is the case for secretory proteins, SRP causes translocation arrest of the four receptor subunits, which is released only after the addition of microsomal membranes. Thus, the initial events in the translocation of secretory proteins and the integration of membrane proteins (i.e., those which require translocation of a domain) are identical. These findings settled a long controversy and demonstrated that the integration of these integral membrane proteins is not a spontaneous, unassisted event as had been postulated. David then extended his studies to other membrane proteins and made similar findings. The important general conclusion which can be drawn from his work is that *Omnis membrana e membrana*, i.e., biological membranes can be formed only from preexisting membranes. David was awarded a Helen Hay Whitney fellowship and he has started postdoctoral studies at Columbia University.

BRADLEY A. ARRICK

Carl F. Nathan

Bradley Arrick and I came to this campus at the same time, and he became my first student. He quickly established other firsts in my experience. Brad was the first person I knew to dream about glutathione and the first who praised glutathione in verse. As biological scientists we are engrossed today by visions of polymers; ropes of DNA and protein encircle the horizons of our imagination and ensnare the funds of our granting agencies. Yet here was a student captivated by a mere tripeptide. The chief distinction of this miniscule molecule is that it provides the most abundant free sulfhydryl in mammalian cells. Brad quickly taught me that glutathione is an intracellular fire extinguisher, quenching smoldering oxidations with the sulfurous foam of its free electrons. He taught me how pharmacologic agents can affect its critical juncture in glutathione metabolism. During the years he was learning how to explain all this to me, his experiments grew swifter and surer, then elegant. They revealed how tumor cells use glutathione to resist oxidative injury inflicted by defense cells of the host, macrophages and granulocytes. He showed how drugs could interfere with the glutathione metabolism of tumor cells and enhance the ability of normal cells to kill the malignant ones. He uncovered relationships between glutathione and anticancer drugs which suggest ways to use the drugs in synergistic combinations never previously considered. Some of what Brad has discovered about antioxidant metabolism applies to protozoan parasites as well. Brad will now move on to finish his clinical training at Cornell. We will be a long time exploring the avenues his work has opened.

ALEXANDER D. BABICH

Joseph R. Nevins

As he was the first student to join my group, Alex Babich holds a unique place in my laboratory. Besides that uncertain distinction, he has been instrumental in the progress of our work. He came with an interest in eukaryotic RNA metabolism after being introduced to animal virology in the laboratory of Eckard Wimmer as an undergraduate at Stony Brook. His initial experiments with us, which aimed to provide him with a start in the workings of RNA metabolism and gene expression, established an important aspect of messenger RNA biogenesis: that the capping of the RNA chain occurred while the transcript was nascent. He then proceeded to investigate in detail the control and alterations of mRNA metabolism during an adenovirus infection of human cells. Utilizing cDNA clones as probes for specific cellular mRNAs, his experiments led to the discoveries that the transport of most cellular mRNAs was selectively halted and that the virus imposes a translational control that discriminates between viral and cellular mRNAs. In parallel, he also defined a viral function that regulates the stability of the early viral RNAs. Recently, he has demonstrated an *in vivo* interaction between the protein defined by those studies and messenger RNA, hopefully opening the way to the elucidation of the mechanism for this poorly understood aspect of control of gene expression. Alex has indeed had a productive career here at Rockefeller. Equally important, however, has been the continuing interest he has displayed in the "heart" of the problems, always being interested in discussions. As such, the rest of us in the lab have benefited from his presence.

PEDRO MIGUEL BERRIOS DEL SOLAR

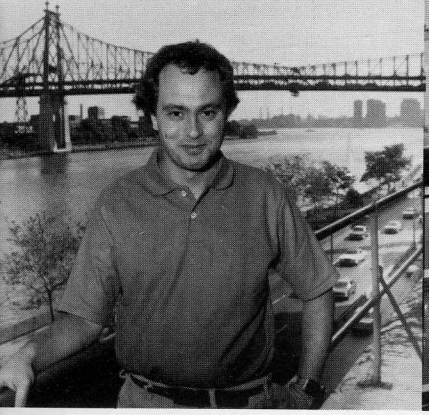
Paul Fisher

Prior to matriculation at Rockefeller, Miguel Berrios received extensive training in reproductive biology in Dr. Claudio Barros' laboratory at the Catholic University of Chile and subsequently with Dr. J. Michael Bedford at Cornell University Medical College. Once here, Miguel worked first in the laboratory of Dr. Elaine Diacumakos, from whom he learned the techniques and approaches involved in the microinjection of living cells, and then began his thesis project under the guidance of Dr. Günter Blobel, with whom I share the role of research advisor for Miguel's dissertation. The considerable efforts of all of these educators are clearly reflected in Miguel's achievements. In his dissertation research, Miguel has succeeded in adapting the technique of direct UV photoaffinity labeling for the study of nuclear structure and function. Through this novel approach, he has been able to positively identify a biochemically active ATPase/dATPase polypeptide specifically associated with nuclear structural-protein subfractions obtained from a wide variety of higher eukaryotes and has been able to purify this polypeptide to near-homogeneity. His research thus serves to open a major new avenue for functionally directed investigation into structure-function relationships of proteins within the cell nucleus. Following graduation, Miguel plans to spend two years at S.U.N.Y. at Stony Brook doing postdoctoral research on the mechanism of eukaryotic DNA replication, and then to return to his native Chile to take a faculty position at the Catholic University in Santiago.

GERALD R. CAMPBELL

Edward M. Johnson

Gerald R. Campbell has focused his thesis research on the "minichromosome" containing the ribosomal RNA genes of the myxomycete *Physarum polycephalum*. This system offers the opportunity to study — and chemically manipulate — vast quantities of a purified chromosome. This minichromosome is present in multiple copies in each nucleus. It has two oppositely oriented genes coding for ribosomal RNA. Replication originates near the center of this molecule and proceeds outward toward the ends. One crucial problem in biology concerns how the ends of chromosomes, called telomeres, can complete the process of replication begun centrally. Jerry's research indicates that DNA recombination plays an important role in the ability of these telomeres to support replication and to maintain themselves throughout evolution as discrete genetic entities. His results on the sequence, packaging, and expression of genes in this unique DNA molecule pave the way for its use as a vector to introduce new genes into higher organisms on stable chromosomes. Jerry has been awarded a fellowship from the Leukemia Society of America to do postdoctoral research at New York University Medical School.



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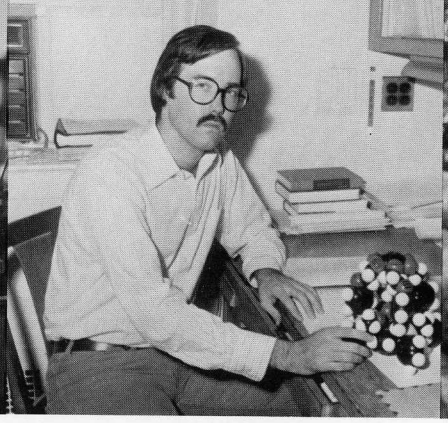

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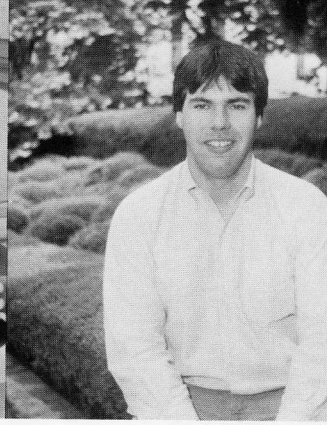


MARSHAK

tions. Jon has a knack for taking abstract textbook principles (some not yet in the texts) and bringing them to life in the chemist's flask. That is a gift that assures him success in the future. He has proved that rapid, long-distance electron transfer occurs. A minimal deduction is that interactions within the excited state of his molecule occur over greater distances than was thought possible. Jon will spend the next year as a postdoctoral fellow in our laboratory reaping further rewards from his synthetic work. His system offers the unique ability to demonstrate the effects of molecular orbital symmetry on electron transfer reactions. Jon's work is a unique contribution to the new field of 3D chemistry.

DANIEL R. MARSHAK

Philip Siekevitz

I am here as surrogate in presenting Daniel Marshak, for while I am head of the laboratory where he worked, his thesis advisor was Dr. Martin Watterson, and both have since moved to the Howard Hughes Institute at Vanderbilt University. Dan's thesis on the biochemistry of drug-binding proteins in the calmodulin/S100 family is notable for three reasons. Calcium ions are probably the most important ions in the nervous system; calmodulin is probably the most prevalent in biology of the calcium-binding proteins; and both calmodulin and S100 are important nervous system proteins. The drugs referred to are the phenothiazines, which have been used for years as antipsychotics and tranquilizers. The biochemical interactions between these proteins and these drugs studied by Dan will serve as an excellent basis for future studies on the means whereby the drugs have their nervous-system effect. Thus, notable in the thesis is the refutation of the common assumption that these drugs act on the nervous system by binding only to calmodulin, whereas we now know, due to Dan's work, that they also interact with other calcium-binding proteins and can be used to isolate these proteins from brain. Dan's work on these interactions will, I am sure, lead to an understanding of how these drugs operate on the nervous system, and how the nervous system itself operates. Dan will spend the next year with Dr. Watterson at Vanderbilt, and then move on as a staff fellow in pharmacology at the National Institute of Mental Health.

BERNARD MATHEY-PRÉVÔT

Hidesaburo Hanafusa

The relationship between a set of cellular genes and the transforming genes (oncogenes) of retrovirouses has been established. The role of these cellular genes in animals, however, has been the subject of speculation. In many cases, even the products of these cellular genes have not been identified. Bernard Mathey-Prévôt succeeded in demonstrating that a cellular protein associated with tyrosine kinase activity is the normal cellular product homologous to the product of *fps*, the oncogene of several avian and feline sarcoma viruses. He then showed that this protein is specifically expressed in the granulocytic lineage of blood cells, which suggests that the protein may be associated with a particular function of blood cells or their differentiation processes. Bernard has also studied the mechanism of phenotypic reversion of cells transformed with sarcoma virus; the revertants behave like normal untransformed cells. He found that in most revertant cells the chromosomal location of the provirus is unchanged compared with the parental transformed cells but expression of the provirus is blocked. The existence of cells in which varying degrees of proviral expression correlated with the extent of cellular malignancy allowed him to conclude that cell transformation in this system is a function of the dosage of the oncogene product. He will be a postdoctoral fellow in the Whitehead Institute laboratory of Dr. David Baltimore at M.I.T.

WILSON H. MILLER, JR.

Irving M. Faust

People who are overweight almost always have greater than normal amounts of lipid in their fat cells. Reduced food intake causes the fat cells to gradually relinquish the excess lipid, but as average fat cell size decreases, physiological resistance to further loss of lipid increases. In some people, fat cells are not only overly enlarged, they are overly abundant as well. Severely obese people may have three or four times the normal number of fat cells. Wilson Miller joined our laboratory shortly after we found that increases in the number of fat cells can be induced in adult rats provided with a relatively brief exposure to certain diets. He wanted to know the source of those newly apparent cells and whether they could be shed as easily as they are acquired. He was also intrigued, as we all were, by the fact that we could make rats extremely obese without inducing an increase in the number of fat cells, and by reports of increased DNA synthesis in fat depots of rats *losing* weight as a result of being housed in the cold. Wilson fasted rats, housed rats in the cold, made rats obese with diets, hormones, and brain lesions, and used a variety of morphologic, biochemical, and autoradiographic techniques (the latter with the much-appreciated assistance of Drs. Ralph Steinman and John Rasweiler) to assess the effects of these manipulations on the fat depots. As a result of these many experiments, we now know that fat cells can be synthesized *de novo* at any time in the life of a rat and are extraordinarily resistant to destruction. We also know the importance of diet composition and of environmental factors in the promotion of adipocyte hyperplasia. Wilson is beginning his last year at Cornell Medical College to complete the M.D.-Ph.D. program.

RICHARD M. MORTENSEN

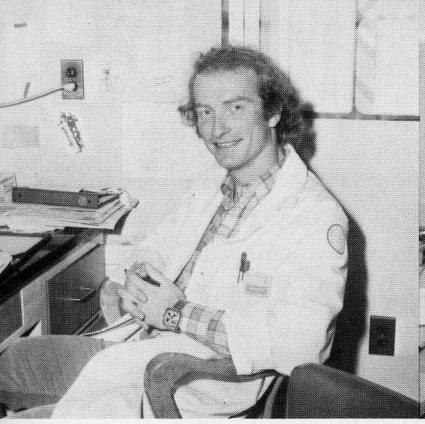
Paul B. Lazarow

Peroxisomes contain an enzyme system which catabolizes fatty acids to acetyl-CoA. The activity of this beta-oxidation system in rat liver is tripled by high-fat diets or starvation, and increased 10-fold by hypolipidemic drugs in clinical use, such as clofibrate. Rick Mortensen investigated the mechanisms by which peroxisomal enzyme activities are regulated. He focused his attention first on a remarkable bifunctional protein that catalyzes two of the beta-oxidation reactions. Using innovative methodology, he determined that clofibrate treatment increases the concentration of this protein some 60 times, and does so by increasing its rate of formation, which in turn is due to an increase in translatable messenger RNA. Rick analyzed the kinetics of the transition from the basal to the clofibrate-induced steady state and back again, employing a mathematical model that took into consideration the significant effect of mRNA half-life on the rate of change in enzyme activity. He also investigated the effects of clofibrate on other peroxisomal proteins, which varied greatly in their response to the drug. Several were regulated in a fashion apparently identical to the bifunctional protein, but one differed significantly, pointing to an additional regulatory mechanism. Rick's results reflect patience and perseverance in the face of experimental obstacles, and they shed fascinating light on the regulation of peroxisomal function. Next year, Rick will be completing the requirements for the M.D. degree at Cornell.

PHYLLIS B. MOSES

Kensuke Horiuchi

The discovery in the early 1970s that restriction enzymes cleave DNA molecules at specific base sequences brought about a revolution in molecular genetics. Genes were now isolated to be studied and were ligated to other pieces of DNA by use of DNA ligase to be replicated. In most cases the ligation was faciliated by single-stranded tails with specific base sequences. Phyllis Moses started her research by purifying and studying a restriction enzyme called *HgaI*. This enzyme recognizes a specific base sequence, but cleaves the DNA at a certain distance from the recognition sequence. Thus, base sequence of single-stranded tails produced by this enzyme is different from one site to another. Using the six fragments produced by this enzyme from the bacteriophage f1 DNA, Phyllis demontrated that only the DNA fragments which were originally adjacent could be ligated and that viable DNA molecules were reassembled with high frequency from a mixture of fragments. This finding provided an efficient method to construct recombinant genomes. Using this unique method and other conventional techniques, Phyllis constructed phages which had restructured genomes, and used them to study the regulation of gene expression. The major coat protein of the phage is produced in a very large amount. This was originally ascribed to the special location of the gene within the genome. By measuring expression of the major coat gene, which she translocated almost 180 degrees on the circular phage map, Phyllis demonstrated that the expression was independent of its location or orientation but dependent on its own promotor. The mRNA transcribed from this promotor is extremely stable compared with the usual bac-



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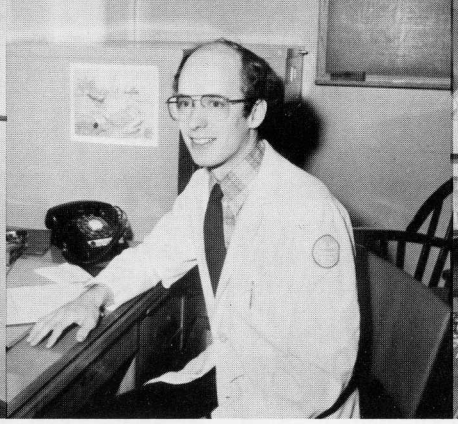

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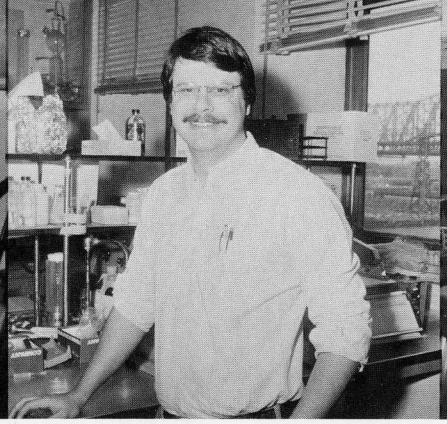

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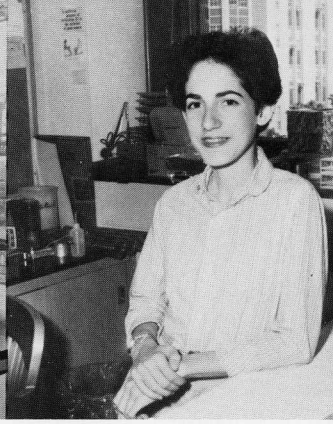


MOSES

terial mRNA such as lac mRNA. Phyllis constructed phage that produced mRNA in which the first 30 bases of the lac mRNA sequence were attached to the beginning of the entire mRNA of coat protein gene. This chimeric mRNA was as unstable as lac mRNA, which indicates the importance of the 5′ end of mRNA on its stability. In addition, Phyllis found a new transcription termination signal in the phage genome. The base sequence of this terminator was quite different from that of the previously known terminators. She will now apply these studies to the molecular biology of higher plants as a postdoctoral fellow in the laboratory of Professor Nam-Hai Chua.

KEITH E. MOSTOV

Günter Blobel

Keith Mostov entered the M.D.-Ph.D. program after graduating with a B.A. (honors) in biology from the University of Chicago and spending one year in Oxford, England, as a Rhodes Scholar. His thesis work here dealt primarily with secretory component (SC), a protein that was discovered in 1965 by Thomas Tomasi in Henry Kunkel's laboratory. When Keith began it was known that SC, being synthesized by glandular epithelial cells, is somehow involved in receptor-mediated transepithelial transport of immunoglobulins (specifically of IgA and IgM) into the external secretions of many glandular epithelia. It was clear that SC, being a *secretory* protein, could not function directly as a receptor since only *integral membrane proteins* can do so. Therefore, the idea prevalent at the time was that another, yet to be identified integral membrane protein must be involved and that SC would then interact both with this protein and with immunoglobulin, quasi being sandwiched between the two. Through Keith's work we now know that this idea was incorrect. An extremely elegant solution emerged instead. Keith found, using cell-free translation and membrane integration systems, that SC is a proteolytic fragment representing the amino-terminal, ectoplasmic domain of a much larger transmembrane protein. Using a colon tumor cell line which he subcloned for efficient production of SC, he then showed by *in vivo* pulse-chase experiments that the larger transmembrane precursor is in fact converted to SC. He succeeded in cloning and sequencing the complementary DNA coding for SC. The latter achievement is a great one, too. There is only one other receptor (the acetylcholine receptor) for which this has been done so far. These findings are important for medicine and for basic cell biology. In the coming year Keith will complete his M.D. degree at Cornell University Medical College.

MARIUSZ SUDOL

Edward Reich

Mariusz Sudol was born and grew up in Tarnow, in eastern Poland. When he finished high school, he won a scholastic competition and entered the program in molecular biology that had just been started in the University of Krakow. As an undergraduate, he was excited by the idea of exploring for new plant sources of medicinally active compounds. Armed with a little Swahili, he shipped out on a freighter that was calling on West African ports. He took advantage of chance encounters to locate people familiar with plants used in folk medicine, and collected specimens from which he extracted biologically active alkaloids. After completing his course in Krakow, he applied for admission to our graduate program. He joined our laboratory shortly after arriving here in 1978 and began work on a project the aim of which was to find out how hormones regulate gene expression. He developed for this purpose an experimental system based on an enzyme — plasminogen activator — whose synthesis responds to many different hormones. He purified and characterized the enzyme from a new cell type that was specially favorable for his work, and cloned the corresponding gene. Together with Dr. Nagamine, he then completed a study of the early molecular events that occur when its expression is induced, and made several new findings. His experiments laid the foundation for later work to be done by his successors. For the next few years he will remain here and join the laboratory of Professor Hanafusa, where he will work on transforming genes and viruses.

WESLEY C. VAN VOORHIS

Ralph Steinman

One of the most challenging situations in biology occurs when a trace component proves to be responsible for function. Wes Van Voorhis encountered this kind of challenge in his thesis on the generation of immune responses in man. He devised techniques for isolating human dendritic cells, which represent less than one percent of circulating white blood cells. Once he distinguished dendritic cells, he could show that they were the principal stimulators of cellular immune responses in culture. Then he pursued evidence from other labs that molecules encoded by immune response genes contribute to lymphocyte stimulation. He found that the immune-response gene products had to be expressed on dendritic cells to activate the mixed leukocyte reaction and the proliferative response to soluble proteins. To carry out the experiments, Wes made use of monoclonal antibodies, some of which he developed himself. Wes returns to Cornell now to complete his medical studies.

JOHN DING-E YOUNG

Jay C. Unkeless

John Ding-E Young came to Rockefeller University with an M.D. degree from National University of Brasilia. After a period working with Dr. Alex Mauro, he joined the laboratory of cellular immunology and physiology to study macrophages. In response to binding of immune complexes to Fc receptors, macrophages and neutrophils will phagocytose or eat the offending antibody-coated particle, as well as release potent inflammatory agents. Ding-E decided to study the mechanism by which macrophage Fc receptors, after binding of immune complexes, transmit a signal to the macrophage. What followed was a remarkable series of experiments which show that there are striking analogies between excitable cells such as nerve and muscle and macrophages, which are not classically thought of as electrically excitable. Ding-E demonstrated that macrophages depolarize from their resting potential in response to binding of immune complexes. Similar effects could be observed in isolated plasma membrane vesicles and in phospholipid micelles reconstituted with purified Fc receptor. These permeability changes were due to a Na^+- and K^+-specific channel opening in response to ligand. The presence of a channel was rigorously demonstrated by reconstitution of the purified Fc receptor in a planar lipid bilayer under circumstances where unitary conductance changes were visible in response to ligand. In addition to these exciting observations, Ding-E also studied proteins isolated from the pathogenic ameba *Entamoeba histolytica* and the bacterium *Neisseria gonorrhoeae*, which insert into lipid bilayers to form channels. These proteins, which he will continue to study in *Entamoeba histolytica* as a Jane Coffin Child postdoctoral fellow in the lab, may be involved in the cytopathic effect of these parasites.

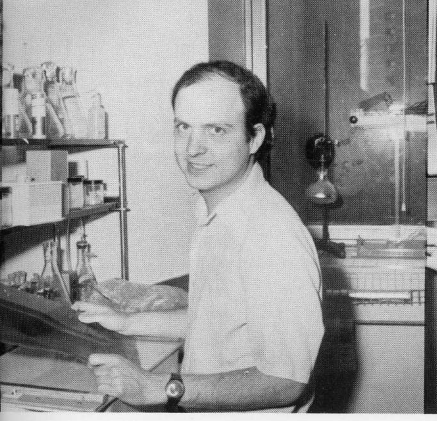
HONORARY DEGREES

FRANK BRINK, JR.

Clarence M. Connelly

If Detlev Bronk was the father of the graduate program that made The Rockefeller Institute for Medical Research into a legitimate University, then Frank Brink was the midwife, wet nurse, and nanny who brought that program to maturity. Bronk and Brink were colleagues for

Clarence Connelly, left, and Frank Brink



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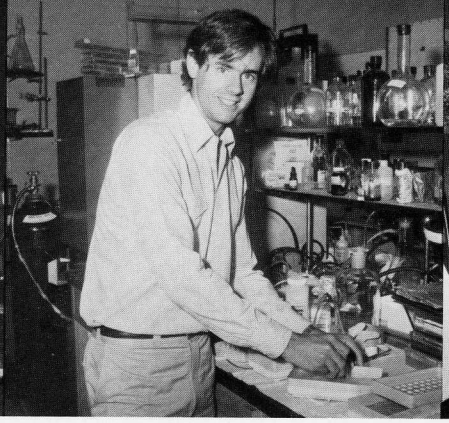
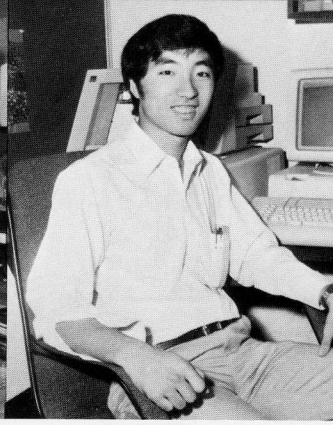


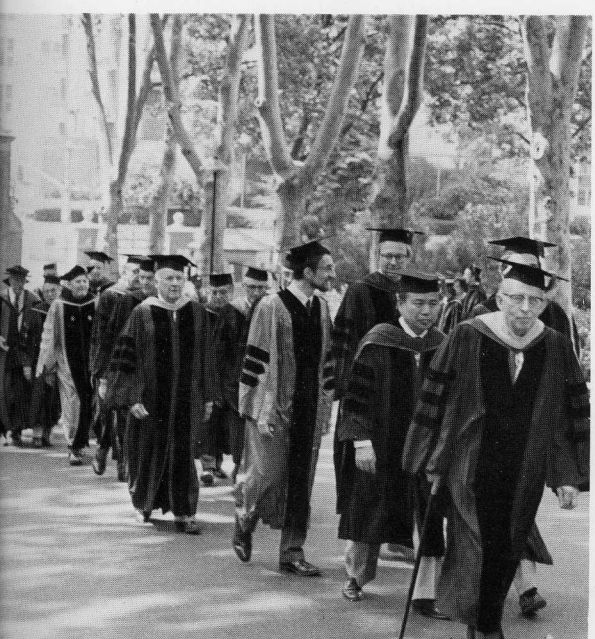
VAN VOORHIS



YOUNG

40 years at four different institutions. They collaborated in laboratory research and teaching. On coming to Rockefeller they planned and worked together in setting up a unique graduate program in what was then, and still is, primarily a research institution. The program was envisioned as an open set of opportunities: outstandingly capable young scholars would pursue studies independently and conduct research alongside senior colleagues. As the number of enrolled students increased above the first 10 that entered in 1955, the program of necessity evolved. Faculty had to be induced to tutor and to lead seminars, to define academic areas and provide some instruction, to define academic requirements, to determine standards of satisfactory compliance, to read and judge theses. It was Brink's practical and even hand that harmonized student need and faculty response. By 1972, when he retired as its first dean, the University had graduated 213 students. He had counseled and guided them all, individually and in collaboration with faculty research advisors. A tally of his graduates who have become today's leaders in science documents the quality of his leadership and initiative in making a vision work; he could have no finer testimonial. Frank Brink is first of all a scientist. A native of Pennsylvania, he studied physics and physical chemistry at Penn State, physics at Caltech, and for his doctorate, biophysics with Detlev Bronk in the Johnson Foundation for Medical Physics at the University of Pennsylvania. Except for one year when Bronk's group was at Cornell Medical College, he continued his research at the Johnson Foundation before moving with Dr. Bronk to Johns Hopkins in 1949. He was appointed professor at Rockefeller in 1953 and was Detlev W. Bronk Professor from 1974 until he became emeritus in 1981. Dr. Brink's principal researches have dealt with the biophysics and physiology of nerve. One major area of long-time interest and study has been the oxidative metabolism that supplies the energy to restore a nerve to normal after it conducts impulses. In the early 1940s he collaborated with Philip Davies in perfecting a micro-polarographic method for measuring oxygen concentration in solution. Since then, Brink and his colleagues have adapted the method to measure the minute amounts of oxygen consumed by a few milligrams of nerve under a variety of conditions. An identifiable component of the oxygen metabolism supports and directly measures the activity of the ionic pumping mechanism that reverses the downhill ionic movements taking place across the nerve membrane during impulse conduction. A month ago, the day before Dr. and Mrs. Brink departed for a holiday in Alaska, he handed me a reprint of his just-published extension of this work, titled Linear Range of Sodium Ion Pump in Sciatic Nerve of Frog. Earlier in his career Dr. Brink studied the role of calcium ions in controlling the excitability of excitable cells, particularly nerve and muscle. In solutions low in calcium ion, the threshold of excitation falls and nerve fibers spontaneously discharge impulses. He was able to observe and record in the squid giant nerve fiber an underlying rhythmic, subthreshold oscillation of the electric potential across the nerve membrane when he adjusted the calcium level in the bath. These observations have permitted interpretation of certain clinical syndromes in terms of disturbed calcium metabolism. In 1954 he published a review on the basic pharmacology of calcium that stood as a landmark for a generation. Frank Brink has always been a friendly and modest man, full of ideas and happy to share them, gratified if a colleague or student capitalized on his generosity and encouragement. In almost every way he is a dedicated perfectionist, be it in laboratory experimentation, in his role as teacher or advisor, in his own writing, in his editing and reviewing for scientific journals, or in his choice of spouse. He served for three years as the first editor of the *Biophysical Journal*; he worked closely for many years with Dr. Bronk in editing the *Journal of Cellular and Comparative Physiology*; and he has been a constant and invaluable reviewer for *The Journal of General Physiology*. A member of the National Academy and of their editorial board, he has served twice as chairman of the President's committee for the National Medal of Science. By his dedication to science, by his 30 years of loving and loyal service to The Rockefeller University, and by his presence here today, Frank Brink honors us. As his student and colleague, I am honored to present him.

Commencement 1983

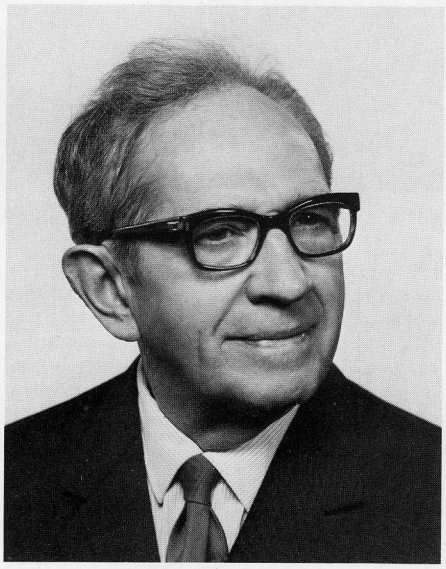


DANIEL NATHANS

Norton D. Zinder

Though led by individuals, science is a communal enterprise wherein the lives and works of some will touch and touch and touch again. Daniel Nathans received his bachelor's degree from the University of Delaware in 1950 and the M.D. from Washington University, St. Louis, in 1954. After a stay at the NIH and at P&S, he spent the years 1959-62 here at The Rockefeller as a guest investigator in the Lipmann lab. From 1962 until today, he has achieved ever-increasing rank at The Johns Hopkins University School of Medicine. Currently, he is a senior investigator of the Hughes Laboratories. Recall the window of 1959-62 when Dan was here as a postdoctoral fellow. He was studying *in vitro* protein synthesis in *E. coli* extracts. It was the time of the messenger RNA hypothesis. I had some phage RNA which I believed would act like a messenger RNA. Today, it's hard to believe how difficult it was then to keep an extract alive or an RNA from fragmenting. We were slowly able to demonstrate that Dan's extracts plus my RNA would synthesize the complete coat protein of the phage. This result provided solid proof for the fidelity of the *in vitro* protein synthesizing system which was just then also being fed nucleotides of known sequence and composition, ultimately to lead to the complete delineation of the genetic code. Moving to Hopkins, Dan first showed that the antibiotic puromycin acted as a protein synthesis chain terminator. He also contributed significantly to our understanding of the interrelated regulation of the synthesis of the various proteins of the RNA phage. Although I'm sure we saw each other during that period at Gordon Conferences, my next solid memory of Dan is a surprise encounter in the Rome airport in January 1969. I was returning home after giving a series of lectures in Israel and Dan was on his way to Israel to learn in Winocour's lab at the Weizmann Institute the tricks of the trade in handling simian virus 40. This was a critical moment for science, for Dan was to use SV40 to great advantage. A short time later, at the 1970 Gordon Conference, Dan and I discussed the perplexing results we each had with an enzyme called the *E. coli* B restriction endonuclease. He was cutting SV40 and we a phage DNA with it. It cut these small rings only once but seemed to cut them anywhere. Dan quickly switched to the newly discovered *Hemophilus* enzymes. They cut at unique places; some at several sites. One after another, results came tumbling out. First the pieces were sized, then partially cut to put the pieces in order. The first restriction map was made. With the map at hand, the direction of DNA synthesis was determined by clever pulse-labeling and cutting. Techniques were developed for *in vitro* mutagenesis of specific fragments. When a cascade of restriction enzymes specific for different DNA sequences fell upon us, Dan's pioneer studies provided the insights and tools needed for their most efficient use. The DNA cutting scissors of restriction enzymes provided the pieces that after isolation would form the inserts for recombinant DNA experiments, and in turn be cut out after amplification for nucleotide sequence analyses. More than 20 years have elapsed since Dan and I first met. We've worked in the lab together, we've competed, we've sat on committees together. There were times of relaxation and times of tension. Dan's soft-spoken manner and wise counsel were always a source of enlightenment. I'm proud to call him not only colleague but also friend. □

ALBERT CLAUDE 1899-1983



Albert Claude, 1971

Professor Emeritus Albert Claude, who has been called the father of modern cell biology, died on May 22 in his native Belgium at the age of 84. In 1974 he shared the Nobel Prize in Physiology or Medicine with George E. Palade, his Rockefeller colleague, now at Yale, and Professor Christian de Duve, who joined the University's faculty in 1962.

Dr. Claude was born in the village of Longlier on August 23, 1899. At the age of 12, he left school to work in a steel mill. During World War I he served British intelligence and was decorated for valor. Although he had not been in the armed forces, he was allowed to take advantage of a government disposition through which veterans could enroll in university studies without a diploma or examination. He earned a medical degree from the University of Liège in 1928.

He came to Rockefeller in 1929 to work on Rous sarcoma virus, which he isolated and characterized as an RNA virus. Turning to cell studies, he pioneered the use of the electron microscope. In collaboration with Keith Porter and Ernest Fullam, he obtained the first electron micrograph of a cell, published in 1945 in *The Journal of Experimental Medicine*. He also developed the means for quantitative isolation of cell organelles through centrifugal fractionation.

He returned to Belgium in 1949 to assume the directorship of the Jules Bordet Institute of the Free University of Brussels. He felt, says Dr. de Duve, a fellow Belgian, "an almost missionary zeal to participate in the reconstruction of Europe." He moved to the Catholic University of Louvain in 1971, the same year The Rockefeller University gave him an honorary degree.

In Dr. de Duve's words: "Albert Claude belonged to that small group of truly exceptional individuals who, drawing almost exclusively on their own resources and following a vision far ahead of their time, opened, single-handed, an entirely new field of scientific investigation." □

HONORS & AWARDS

William O. Baker, chairman of the University's board of trustees and retired board chairman of Bell Telephone Laboratories, Inc., was awarded an honorary doctor of science degree by Clark University in Worcester, Massachusetts, on May 22, and he delivered the commencement address. Among his recent activities, Dr. Baker served on the National Commission on Excellence in Education, which prepared the widely discussed report *A Nation at Risk: The Imperative for Educational Reform*, published in April. He also participated in the preparation of *America's Competitive Challenge*, a report submitted to the President by the Business Higher Education Forum.

Professor **Günter Blobel**, Cell Biology, received the 1983 Warburg Medal, the highest award of the German Biochemical Society, presented in Mosbach on April 14.

Ellen Borenfreund, adjunct associate professor, Laboratory Animal Research Center, and associate member, Memorial Sloan-Kettering Cancer Center, was selected 1983 Outstanding Woman Scientist by the Association of Women in Science, announced at an awards ceremony at the New York Academy of Sciences, June 1.

Professor **George Cross**, Molecular Parasitology, has been awarded the 1983 Chalmers Medal of the Royal Society of Tropical Medicine and Hygiene, announced in London at the Society's June 16 meeting. He has also been named co-recipient of the 1984 Paul Ehrlich and Ludwig Darmstaedter Prize of the Paul Ehrlich Foundation, to be awarded in Frankfurt, Germany, next March 14, the anniversary of Ehrlich's birth.

Professors **Peter Marler**, Animal Behavior, and **Abraham Pais**, Theoretical Physics, have been elected to membership in the American Philosophical Society, the oldest learned society in the country, founded in Philadelphia by Benjamin Franklin.

Professor **Fernando Nottebohm**, Animal Behavior, was elected a fellow of the American Academy of Arts and Sciences at the Academy's 203rd annual meeting on May 11 in Cambridge, Massachusetts. The Academy is a national honorary society founded in 1780 by John Adams.

Award Named for Field

The American Chemical Society has established the Frank H. Field and Joe L. Franklin Award for Outstanding Achievement in Mass Spectrometry, sponsored by Extranuclear Laboratories, Inc. The first award will be presented in 1985 at the meeting of the American Society for Mass Spectrometry.

The new award honors Professor Frank H. Field, head of the University's laboratory of mass spectrometry and gaseous ionic chemistry, and the late Joe L. Franklin, with whom Dr. Field worked for many years at Humble Oil and Refining Company in Texas. Dr. Field has been a major contributor to the development of mass spectrometry and its applications as a tool in the analysis of biomedical materials. For the past decade, aided by funds from The National Institutes of Health, his laboratory has provided mass spectrometry research, development, and service to biomedical institutions from all over the metropolitan area. □

Meritorious

Margaret Broadbent, manager of The Rockefeller University Press journals office until her retirement in 1979, continues to be an active member of the Council of Biology Editors, which on May 19 presented her with their Meritorious Award for contributions to scientific publishing.

At the awards dinner in Philadelphia, the guest of honor, addressing several hundred scientific editors and publishers from around the world, talked about an editor at Rockefeller who exemplified the highest standards of English usage in science writing. Her subject's name was Peyton Rous, who, in addition to winning the Nobel Prize for demonstrating a viral-caused cancer, edited *The Journal of Experimental Medicine* for almost 50 years. The text of Miss Broadbent's remarks will appear in an upcoming issue of the quarterly publication of the Council of Biology Editors.

news and notes is eager to report on the activities of Rockefeller retirees. The roundup in the October-November 1981 issue was one of the most popular pieces we've run. Keep us informed. □

Outstanding

Two summers ago, Lawson Bernstein, Jr., then a third-year honors student at Hunter College, worked in the University's immunology laboratory with Professor Robert G. Lahita on a study of sex hormone metabolism in mice with the disease lupus.

Dr. Lahita reports with pride that Mr. Bernstein's efforts have won him a Salk Award. The prize is presented by the City University of New York to a select group of graduating seniors going on to medical school who have done outstanding scientific research while undergraduates. Mr. Bernstein will enter the Cornell University Medical College this fall. □

BRIEFS

President Lederberg delivered the George Gay Lecture at the Harvard Medical School on May 18. His subject was Artificial Hearts: What Lies Ahead.

William W. Lowrance, director, Life Sciences and Public Policy Program, has been appointed to the Executive Committee of the Science Advisory Board to the U.S. Environmental Protection Agency, effective June 7. On May 18, Dr. Lowrance gave the keynote address to the annual convention of the National Safety Management Society, in Dallas. His topic was Upcoming Issues in Safety Management.

Professor **Victor J. Wilson**, Neurophysiology, was an invited speaker at a symposium, Sensory-Motor Integration in the Brain, held April 7-9 in Göttingen, Germany, in honor of the 80th birthday of Sir John Eccles. He subsequently lectured at the University of Munich and at the Neurological Clinic of the Technical University of Munich.

1983-84 Concert Schedule

The Rockefeller University Concerts for 1983-84 will be presented in two series. They will be on Wednesday evenings at 8 in Caspary Auditorium with the exception of October 13 and 27 and November 10, which are Thursdays, and Tuesday, March 13.

Series A: Lausanne Orchestra (October 13); Shura Cherkassky, pianist (November 2); Salvatore Accardo, violinist (November 16); Orpheus Chamber Orchestra (January 11); Beaux Arts Trio (February 22); Gabrieli String Quartet (March 13); Jury's Irish Cabaret of Dublin (April 11); and an April 25 program to be announced.

Series B: Orlando String Quartet (October 27); Elisabeth Söderström, soprano (November 10); Franz Liszt Chamber Orchestra (November 30); John Browning, pianist (January 25); Muir String Quartet (February 8); Stuttgart Chamber Orchestra (March 7); Horacio Gutiérrez, pianist (April 4); Guarneri Quartet (May 2).

Tickets can be purchased for either series, at $64 each, or both, at $128, from the accounting office cashier. (Checks should be made out to The Rockefeller University.) □

PROMOTIONS

Elliot F. Hahn, Biochemical Endocrinology, to associate professor, effective June 1.

Irving M. Faust, Human Behavior and Metabolism, **Ehud Kaplan**, Biophysics, and **Robert H. Schor**, Neurophysiology, to associate professor, effective July 1.

James R. Gilmore, Cell Biology, to assistant professor, effective June 12.

Lloyd F. Mayer, Immunology, and **Burt A. Ovrut**, Theoretical Physics, to assistant professor, effective July 1.

APPOINTMENTS

Paul Greengard, Molecular Neuroscience, as professor, effective April 1.

Lab Roundup: Rheumatic Fever, Toxic Shock, Photosynthesis, Naloxone

Rheumatic Fever

Professor John B. Zabriskie, Bacteriology and Immunology, working with Dr. Manuel Patarroyo of Bogota, Columbia (now on the University's adjunct faculty), and Drs. Robert J. Winchester and Henry G. Kunkel at Rockefeller, have screened the blood of hundreds of pregnant women in search of a genetic marker for rheumatic fever, a disease triggered by streptococcal infection. They have identified two antibodies that bind to antigens present on the surface of immune cells (B lymphocytes) found in nearly all the rheumatic fever patients they have tested.

Dr. Zabriskie and Dr. Dietmar-Braun of CIBA-Geigy subsequently succeeded in isolating monoclonal antibodies that have the same activities. Tested on populations in New York, New Mexico, and India, the antibodies identified 96 percent of rheumatic fever patients. This suggests that the markers are worldwide in distribution, says Dr. Zabriskie, and raises the possibility of universal screening, particularly in less-developed nations where antibiotics are in scarce supply. Blood taken from the umbilical cord might be treated with monoclonal antibodies to test for the presence of the cell-surface markers, and most of those at risk would be identified before the onset of the disease. Rheumatic fever now strikes more than 10 million annually.

Toxic Shock

In the 1960s at Rockefeller, Dr. Zabriskie demonstrated that scarlet fever is caused when streptococcus bacteria are infected by viruses (also called bacteriophage); the bacteriophage induce streptococci to produce the toxic agent of scarlet fever.

Toxic shock syndrome is an illness that has perplexed investigators. During the last four years, hundreds of cases have been reported, primarily among young, menstruating women, and there have been several fatalities. Victims of scarlet fever and toxic shock, Dr. Zabriskie noted, have remarkably similar symptoms: fever, rash, and low blood pressure. This led him, along with Professor Vincent A. Fishetti and Steven E. Schutzer, a postdoctoral fellow, to look for a toxin-producing bacteriophage in toxic shock, a disease associated with *Staphylococcus aureus* bacteria.

The results have been encouraging. Bacteriophage were found in 11 of 12 samples of *S. aureus* taken from toxic shock patients. Only one of 18 *S. aureus* samples not associated with the disease contained bacteriophage. Now the research team is trying to determine if the bacteriophage can be linked directly to toxin production.

Early Photosynthesis

Dr. Janet Mercer-Smith, formerly assistant professor and now a Rockefeller adjunct, and Professor David C. Mauzerall, Biophysics, have successfully tested chemical models which seem to confirm the late Professor Sam Granick's theory that life evolved by means of primitive photosynthesis. The theory contrasts with a picture of early life painted by Oparin and Haldane more than half a century ago: that the first organisms lived in a primordial soup of organic compounds synthesized during electrical storms and geologic disturbances.

Drs. Mercer-Smith and Mauzerall believe members of the porphyrin family — common light-absorbing pigments — were the first photosynthetic molecules. Their experiments showed that porphyrins could oxidize organic compounds believed to be present on the early earth. In an oxidized state, they believe, these organic compounds served as building blocks for more complex molecules which were the basis for the first living cells.

Naloxone

Professors Mary Jeanne Kreek, Jack Fishman, and Eliot F. Hahn, Biochemical Endocrinology, and Dr. Robert A. Schaefer, New York Hospital-Cornell Medical Center, have described dramatic reversals of long-standing constipation with oral and intravenous administrations of naloxone. Naloxone, a substance that inhibits the body's response to opiates, was first synthesized by Dr. Fishman in the 1960s.

It has been known for 2,000 years that natural opiates, such as paregoric, promptly reverse acute and chronic diarrhea, which indicates a connection between opiates and the digestive tract. Yet it was not until the 1970s that researchers found opiate-like substances in the body, with receptor sites primarily in the brain and intestines. The investigators say these findings support their theory that an excess of endogenous opioids, and/or enhanced binding at receptor sites, may be responsible for certain types of severe constipation. □

VPs continued from page 1
on the Rockefeller Hospital's Institutional Review Board since its inception in 1974.

In announcing the appointments President Lederberg states: "We are fortunate to have in our own ranks men like Drs. Choppin and Kappas who can bring to administrative roles the special insights of active scientists and physicians. We are also fortunate that we will have the benefit of drawing on William Griesar's broad legal background and his experience in university-industry relations in an era of ever more complex interactions with government and industry." □

SEITZ continued from page 1

Dr. and Mrs. Frederick Seitz at the National Science Foundation dinner, May 18.

The Bush Award, named for the scientist whose efforts led to the creation of the National Science Foundation, is presented from time to time to acknowledge outstanding contributions in science and technology that have particular significance to national welfare. Dr. William O. Baker, chairman of the University's board of trustees and retired chairman of the board of Bell Laboratories, was the second Vannevar Bush Award winner, in 1981. □

E.T. Would Have Loved It

Do you know what to do if:

- You're awaiting a call from California at the same time you're expected across campus?
- You've been trying to reach *news and notes* (personnel, purchasing, the pharmacy) for 20 minutes but the line is busy?
- You've got to work out the wording of a grant proposal with a colleague in Flexner Hall and another in Pittsburgh?
- You've got a caller who should really speak to Dr. X but you want to be sure first Dr. X is amenable?

The answers are: call forwarding, automatic callback, conference call, and hold and transfer. These and other useful features are available on all University phones, whether they're simple single-line dial instruments or the multi-lined touch-tone kind. They work with the press of a button or the flick of the switch hook and the dialing of a couple of code numbers.

For example, in the case of the California call, you need only dial 45 (or press the call-forwarding key), dial the extension you want, and the call will be automatically transferred. You can use this service to have your phone answered on another University line when you're out of town or on vacation; and you can even arrange, by dialing 46, to have your own phone ring, first (three rings), just in case you might be there, before the call is forwarded. When you're ready to cancel, dial 67.

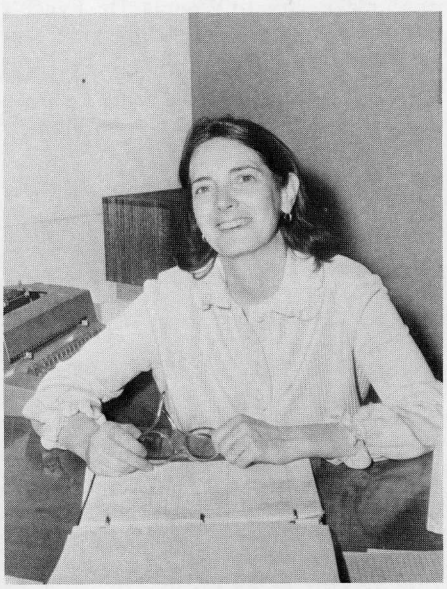
The complete instructions for the Dimension 2000 system, as it's called, are in the booklets that were distributed when the phones were installed. If you've lost your booklet or you're having difficulty following the directions, call Kenneth Schmitt, associate superintendent of plant operations, on extension 8001. (If his line is busy, just instruct your phone, by dialing 47, to ring you when he's free.) □

Abraham Pais, winner of a 1983 American Book Award for Science for Subtle Is the Lord. . . The Science and the Life of Albert Einstein, *at the awards ceremony on April 28.*

IN PRINT

The UNIX Operating System by Research Associate **Kaare Christian** of the laboratory of electronics and microprocessors, has been published by Wiley-Interscience. UNIX is a computing system developed by Bell Laboratories which is used at the University and widely in science and industry. The book provides basic information for beginners and more detailed instruction for advanced users as well as a glossary of UNIX system terms and a UNIX system manual.

Nancy La Valle Is Employment Manager



Nancy La Valle

Nancy La Valle, affirmative action coordinator, has been promoted to employment manager in the personnel office, succeeding Lucy Jeffers who retired April 30.

Mrs. La Valle first came to the University in 1966 and worked as assistant to Mrs. Jeffers in the recruitment and selection of non-faculty personnel. After two years, she left Rockefeller to join a major financial corporation and was employment manager there for seven years. In 1977, when the firm relocated to Connecticut, Mrs. La Valle returned to the University's personnel staff and assumed duties primarily in the field of equal employment and affirmative action.

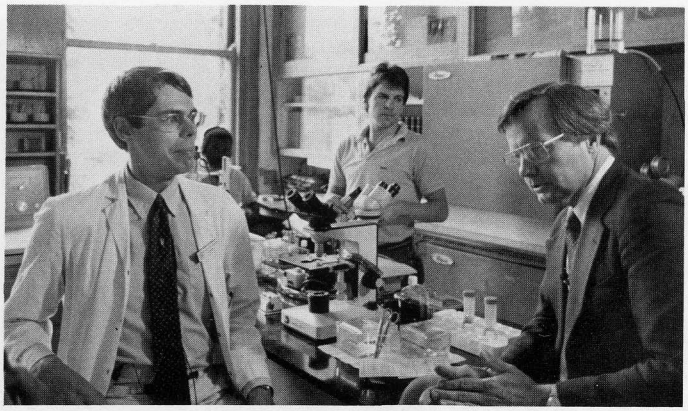
In her new position she is responsible for the recruitment, screening, and selection of non-faculty personnel and employee relations, and she will continue to be involved in equal employment opportunity and affirmative action. □

PERSONALS

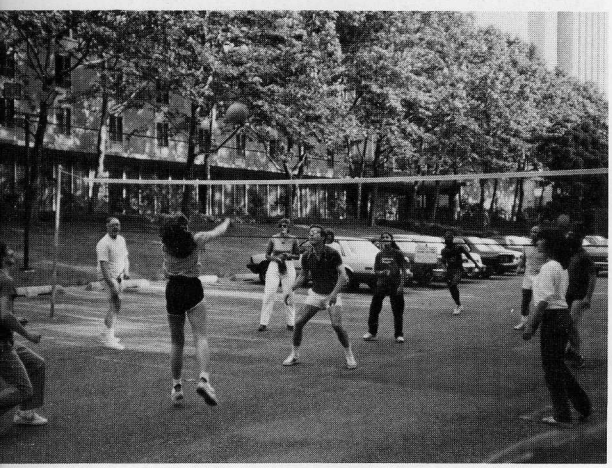
1983 Graduate **Pedro M. Berrios** was married on June 11 to Ann Loughlin, an administrative assistant of the Metropolitan Club in New York.

Assistant Safety Officer **Thomas Cosentino**, Laboratory Safety, was married on March 26 to Teri Fobes, a biochemist at Ortho Diagnostics Systems.

Born April 15 to Mail Clerk **José E. Santos** and his wife, Mayra, a daughter, Lizza Marie, their first child.



Dr. Jeffrey Laurence, a guest investigator in the immunology laboratory of Professor Henry Kunkel, interviewed by Bill Moyers of CBS News. A program about research conducted by Laurence and others on AIDS is scheduled to air in August as part of the "Our Times With Bill Moyers" series.



Gimme an L, Gimme an I, Gimme a P. *On June 7, the Kiss My Lipids Athletic and Drinking club trounced the aptly named Under-Developed team four games to none in the opening event of this championship volleyball season. Playing for the Under-Developed, near court, from left: William Steward, Diane Battista (back to camera), Charles Molloy, and Elizabeth McKay. (Members of the team not pictured: Patrick Garvey, Jennifer Lopez, Jane Palmer, Johanna Tiemann.) Playing for Kiss My Lipids: Rachel Kolb, Patricia Macklin (hidden), Martha Healy, Clinton Brown, Richard Hershcopf, and Thomas Parker. (Not pictured: Dorothea Caldwell, Ellen Markowitz, Oneida Ortiz.)*

RU Speakers at AAAS; Four Elected Fellows

Professor Gerald M. Edelman, Developmental and Molecular Biology, delivered a Public Lecture at the 1983 meeting of the American Association for the Advancement of Science, held May 26-31 in Detroit. His topic was Brains and Embryos: Cell Recognition in Early Development.

Professor Norton D. Zinder, Genetics, debated Nicholas Wade of the *New York Times* on Fraud and Dishonesty in Science.

Executive Vice President Rodney W. Nichols spoke on Freezes, Treaties, Stops and Starts: Current Issues in Arms Control.

Other Rockefeller participants were: Adjunct Professor H. Leon Bradlow, Endocrinology, who chaired a session on Progress in Corticosteroid Research; Research Associate Samuel D. Wright, Cellular Physiology and Immunology, who spoke at a session on the Phagocytic Cell; and Professor Michael W. Young, Genetics, on Gene Regulation in Development.

Professors Joel E. Cohn, Joel A. Grinker, Ralph Norgren, and Fernando Nottebohm were elected association fellows, an honor accorded by the AAAS Council to members "whose efforts on behalf of the advancement of science or its applications are scientifically or socially distinguished." □

Council's 10th Anniversary

Professors George Cross and Robert Roeder addressed the 10th anniversary meeting of The Rockefeller University Council on April 26. Dr. Cross spoke on DNA in Parasitology and Dr. Roeder on DNA in Biochemical Genetics. They were introduced by President Lederberg, who gave an overview of the University's new programs in molecular biology, of which the Cross and Roeder laboratories are representative.

The meeting was opened by University Trustee David Rockefeller, chairman of the council, who welcomed new members and expressed the University's gratitude to the council's founding chairman, James A. Linen III. □

George Mirick Dies

George Swope Mirick, who was an assistant physician at the Hospital from 1939 to 1946, died on April 14 at the age of 74. Dr. Mirick, whose special interest was in viral and respiratory infections, taught at New York University Medical Center and was director of the Health Research Council from 1959 to 1970. □

Robert Miller Dies

Robert Miller, who retired as assistant superintendent of purchases in 1973 after 47 years at Rockefeller, died on June 7 at the age of 74.

Mr. Miller began his career as an office boy. After service in World War II he joined the purchase and supply service as a clerk and was promoted to purchasing assistant in 1954. He was named assistant superintendent in 1970.

In the words of his long-time associate, James Stewart, superintendent of purchase and supply, "Bob Miller was one of the most loyal friends that I or the University ever had. His years of service and dedication will long be remembered by those who were helped by his kindness." □

A Visit to Virginia

In April Professor Merrill Chase went down to Virginia to visit a dear old colleague, Clara J. Lynch, who had celebrated her 101st birthday a few weeks earlier. He reports that they had a good chat and that "every few minutes after she had finished a sentence, her cute laugh came out as of old."

Dr. Lynch, a pioneer in the genetics of cancer, worked at Rockefeller for 53 years, retiring in 1971 at the age of 89. For those who would like to extend wishes but can't make a trip to Virginia, Dr. Lynch's nieces will forward mail. Address it in care of Marcia and Eliza Miller, 5524 Trent Street, Chevy Chase, Maryland 20815. □

DEATHS

Katherine Graham Crutcher, 92, who was a secretary for Alexis Carrel from 1919 to 1945 and for Peyton Rous from 1945 to 1955, on March 27.

Frances Anna Stipek, 83, an animal-attendant who worked at Rockefeller from 1948 to her retirement in 1965, on November 28, 1982.

news and *notes* is published five times a year from October through July. This is Volume 14, Number 5. Suggestions for articles are welcome and may be sent to *news and notes*, Box 194, phone extensions 8968 or 8970. Photographs, page 1 and page 6, bottom left, Graphic Services; pages 2, 3, 4, and 5 and 6, top, Paul Archibald; page 5, bottom right, Ingbert Gruttner; page 7, Henrik Boudakian; page 9, right, Nancy Crampton; page 9, center left, National Science Foundation; page 9, bottom left, George Byron; page 10, center left, Bartolo Manzella; page 10, top left, Peter Tarr.