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The Rockefeller University

THE ROCKEFELLER UNIVERSITY

JULY 1972
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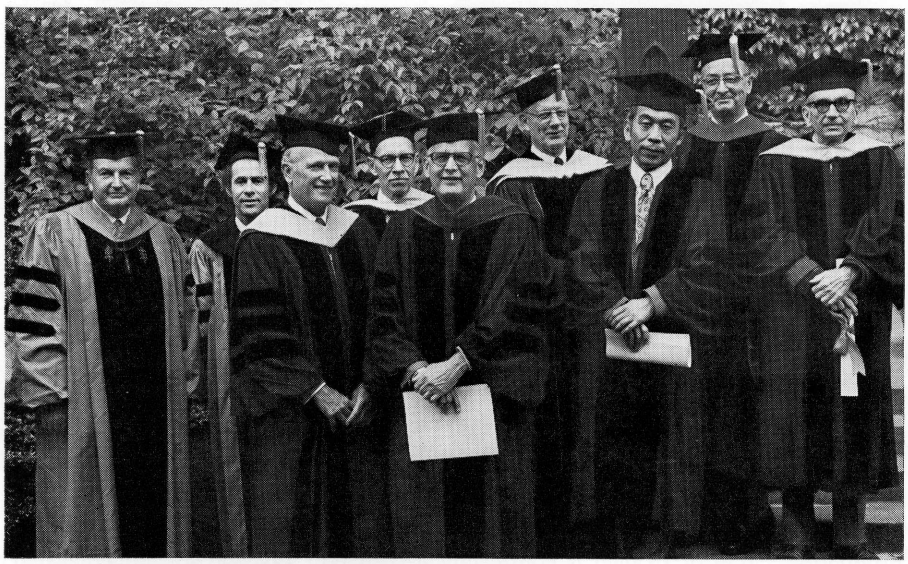
news and notes

Nineteen Receive Degrees at Fourteenth Convocation



On Founder's Hall steps after convocation, left to right: Board Chairman David Rockefeller, Norton D. Zinder, Vice President Carl Pfaffmann, Alfred Day Hershey, Vice President Maclyn McCarty, President Seitz, Hao Wang, Dean Frank Brink, Jr., Kurt Gödel. Dr. Gödel and Dr. Hershey received honorary degrees, presented by Dr. Wang and Dr. Zinder.

Seventeen men and women heard their achievements cited and stood to receive from President Seitz the degree of doctor of philosophy at the University's 14th convocation ceremonies held Thursday, June 1 in Caspary Auditorium. Two others were awarded their doctorates *in absentia*. In addition, honorary doctor of science degrees were bestowed upon Kurt Gödel, one of the world's leading figures in mathematics and logic, and Alfred Day Hershey, Nobel Laureate in physiology and medicine for his work in the genetic structure of viruses. Before an audience of friends, family, fellow students, faculty, and University trustees, including Board Chairman David Rockefeller, each graduate fellow was presented by a faculty member with whom he or she has been closely associated. Professor Hao Wang presented Dr. Gödel and Professor Norton D. Zinder presented Dr. Hershey.

Kurt Gödel was born in Czechoslovakia and was a member of the mathematics faculty of the University of Vienna until coming to the United States in 1938. In 1951 he was corecipient of the Einstein Award. Since 1953 Dr. Gödel has been a professor in the School of Mathematics of the Institute for Advanced Study in Princeton. Dr. Wang characterized him as a "theoretical man with intellectual talents of the highest order. . . . In the foundations of mathematics, his work gave rise directly or indirectly to most of the major developments during the past few decades." Further, "he has done significant work in physics, namely the construction of rotating universes on the basis of Einstein's theory of gravitation." Yet, Dr. Wang noted, Dr. Gödel has probably devoted more of his energy to fundamental philosophy than to science. His work has "revolutionized modern logic, greatly raising its level of significance both mathematically and philosophically."

Alfred Day Hershey was born in Michigan and received the B.S. and Ph.D. degrees from Michigan State University. He taught bacteriology at the Washington University School of Medicine in St. Louis from 1934 to 1950. There, Dr. Zinder said, "he was responsible for describing an important attribute of antibodies"—that a single antibody molecule has a single specificity. From 1950 to the present he has worked at the Cold Spring Harbor laboratories, where he is the director of the Genetics Research Unit of the Carnegie Institution of Washington. "Hershey was the first to describe genetic recombination in bacteriophages," Dr. Zinder noted, "thereby opening them to the whole panoply of genetic analysis." He then turned to the chemistry of phage growth and "in 1952 performed the experiment that turned the tide in our thinking to nucleic acids as genetic material." Dr. Hershey received the Albert Lasker Award of the American Public Health Association in 1958 for his leading part in the discovery of the fundamental role of nucleic acid in the reproduction of viruses and in the transmission of inherited characteristics. In 1965 he was given the Kimber Genetics Award of the National Academy of Sciences, and in 1969 he shared the Nobel Prize with Max Delbrück and Salvador E. Luria.

Convocation ceremonies began at 2 P.M., introduced by a selection of Renaissance airs and dances performed by the American Brass Quintet with Gordon Gottlieb, percussionist. The previous evening graduates and their presenters and families were honored at a reception in the President's residence and a dinner in Abby Aldrich dining room. A trustees' luncheon preceded convocation, and an outdoor reception on the Esplanade followed. The Convocation Ball that evening was the final gala celebration.

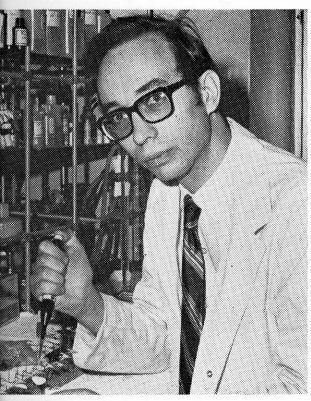
Following are condensations of the remarks made by the presenters. The degree recipients' names appear first.

PH.D. DEGREES

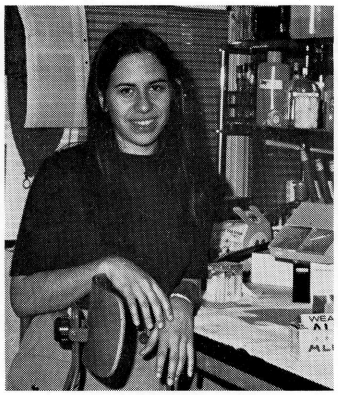
ROBERT S. ANTHONY

Leonard B. Spector

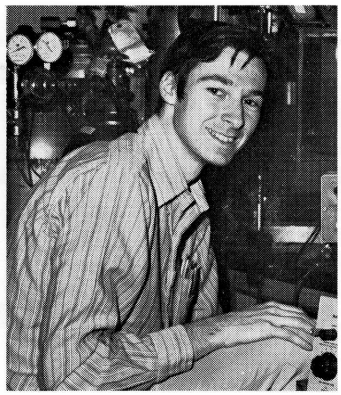
Acetic acid, the chief component of common vinegar, is formed in the course of metabolism by large numbers of the earth's microorganisms. Concurrently with acetic acid production these organisms generate the metabolic energy which maintains their existence. Bob Anthony studied this linked process in intimate detail and, in so doing, threw



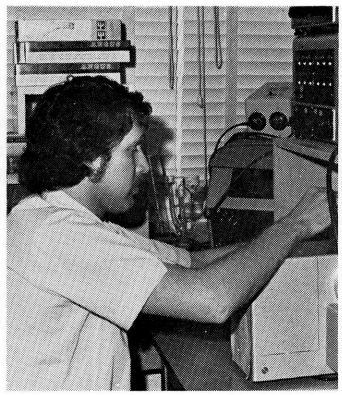
ANTHONY



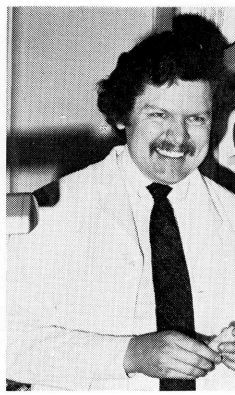
BORGESE



DINER

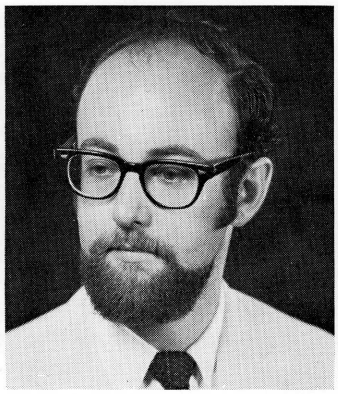


EASTON

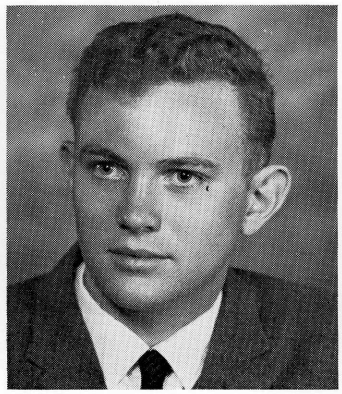


ELLIOTT

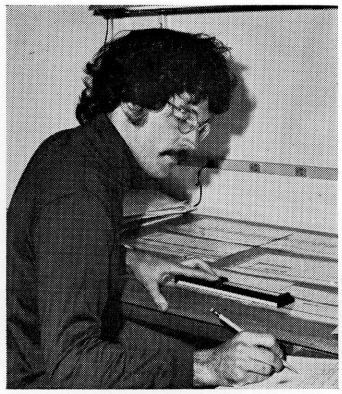
FEDOROFF



FORMAN



GRAY



HOPKINS

JUBIEN

a revealing light on energy production in microorganisms and in higher organisms such as ourselves. Through his labors we now boast of a sharper view of the enzyme as it acts to transform the energy of the cell. Robert Anthony's singular success rests in no sense on luck. It rests entirely on the keen use of his own self-taught skills. These skills are the admiration of all of us in the lab. His special knowledge, seemingly unattainable by others, he shared generously with others. And underlying his marvelous expertise was a restless, driving urge to excel; an unflagging zeal which stirred all of us around him to greater exertions. We are sure that Bob will make his mark in the world.

DOMINICA BORGESE

(Degree granted *in absentia*)

Dominica Borgese's thesis was on the subject of In Vitro Exchange of Ribosomal Subunits between Free and Membrane-Bound Ribosomes. David D. Sabatini was her research adviser.

BRUCE A. DINER

David C. Mauzerall

A few people are born to do scientific research, and it was quickly apparent that Bruce Diner was one of these. During the first year of his work on photosynthesis he isolated a unique cell-free preparation which makes oxygen. The formation of oxygen is completely decoupled from reactions which had been required in previous preparations. This is one of the most significant advances in photosynthesis since Robin Hill first made cell-free preparations 35 years ago. With some encouragement on my part, Bruce then turned to biophysics. An interesting nonlinearity in the light curve of photosynthesis had been discovered by my former student, Helen Herron. Bruce proceeded to study this nonlinearity using modern methods of analysis. The result was the discovery of a novel kind of control system in photosynthesis. The oxygen produced by photosynthesis not only serves in respiration for the plant cell, but this oxygen also makes photosynthesis more efficient. It is characteristic of a good solution of a scientific problem that it often extends well beyond its original intent. In fact, the control scheme has allowed Bruce to offer an explanation of the sudden rise of oxygen in the atmosphere some one billion years ago.

THOMAS G. EASTON

Edward Reich

Thomas Easton did undergraduate work at Michigan State University, where his major interests were microbiology and chemistry. While there he attended a lecture by our own Professor Hotchkiss and decided to do his graduate work at Rockefeller. Easton saw that the time had come when cells of higher organisms could be analyzed with the precise methods and concepts that had emerged from work on bacteria, and he decided to study the behavior of embryonic chick muscle in culture. Easton's work has provided three important advances: (1) The first bears on the question of how cells initiate the series of steps that lead to their final, differentiated form. Easton has obtained evidence that a small molecule present in embryos induces precursor cells to become mature muscle cells, and he plans to purify and determine the structure of this compound. (2) By using inhibitory compounds whose action is specific, he has shown that the messenger RNA molecules that determine muscle differentiation are formed and function independently of other classes of RNA molecules. (3) By studying the effect of tumor viruses on muscle cells he has found that these viruses do not directly interfere with the molecular events involved in differentiation. The further development of these observations could fundamentally alter our views about how viruses give rise to tumors.

DONALD A. ELLIOTT

Martin A. Rizack

As a clinician studying the diseases of children, Don Elliott observed the fluctuation of magnesium levels in the blood of patients and pondered whether this might be related to the action of hormones. At Rockefeller he developed the hypothesis that hormones exercised some of their control of cellular metabolism by causing magnesium to enter cells and

thereby to alter the activity of enzymes. He succeeded in developing a method for continuously monitoring the passage of magnesium across a cell membrane. Using fat cell membranes, he showed that hormones which stimulate the release of fatty acids stored within these cells also accelerate the transfer of magnesium across the cell membrane into the cell. The release of fatty acids is accompanied by a decrease in fatty acid synthesis by the fat cell. The hormonal message for the release of fatty acids is transmitted by cyclic-AMP. This compound has no effect on fatty acid synthesis. Magnesium, however, inhibits fatty acid synthesis, and the rise in magnesium level in fat cells caused by the hormones is sufficient to bring about the effect. Magnesium, therefore, plays a role in the regulation of at least one metabolic pathway in cells and probably others as well.

NINA V. FEDOROFF

Norton D. Zinder

Although the bacteriophage f2 was the first of a series of RNA-containing bacteriophages to be discovered, the enzyme responsible for the replication of its RNA was extremely refractory to isolation. Nina Fedoroff guessed and hoped that the instability of the f2 enzyme was due to the loss of subunits during purification rather than some intrinsic instability of the enzyme itself. Studying the simplest of its reactions, the polymerizing of guanosine triphosphate residues, she was able to purify this activity from phage-infected cells. Using appropriate phage mutants, she was able to show clearly that it contained a phage-specified polypeptide. By precise chemical fractionation and careful attention to detail she was able to reconstruct the full activity even to the point of using plus strands as template. Analysis of the optimum conditions for enzyme function leads Nina to speculate that the enzyme has two functional sites, one for initiation of the reaction and another for polymerization. The way is now open for a detailed analysis of the mechanism of action of this most interesting enzyme using the many mutants in the phage-specified polypeptide that are available.

DAVID FORMAN

Bruce S. McEwen

Though he didn't realize it then, David Forman chose the topic for his thesis when he wrote his first-year review paper on the movement of cellular constituents within the axons of neurons. Work in the laboratory of Dr. Paul A. Weiss had established the existence of a flow of the axoplasm at the rate of around 1 millimeter per day. In 1967 Dr. Bernice Grafstein and I were investigating a transport of axoplasmic constituents which occurred nearly 100 times faster. Dave joined us to study this fast axonal transport. He chose to study the transport of glycoproteins and glycolipids because they are found on the surface of neurons and may play a role in the recognition and attachments between neurons. Using an elegant double-label technique, he showed that glycoproteins travel rapidly in the fast axonal transport and not in the slow axoplasmic flow. Dave obtained the best estimates to date of the axonal transport rate. He also initiated a collaboration with Dr. Robert Ledeen of Albert Einstein College of Medicine in which they showed for the first time that glycolipid is transported rapidly. Both discoveries indicate that the fast and slow movements in axons involve different axoplasmic constituents. They make possible neurochemical studies of the functional role of glycoproteins and glycolipids in mature, developing, and regenerating nerves.

PETER GRAY

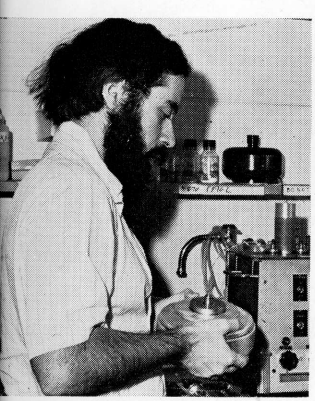
Jay M. Weiss

Peter Gray's dissertation is indeed a remarkable piece of work. It consists of over 15 complete experiments in which Peter first delineated a new behavioral phenomenon and then showed that the behavioral effect depended upon the presence of mineralocorticoid hormones. In so doing, he presents us with the first demonstration that mineralocorticoid hormones can affect behavior other than that concerned with salt metabolism. When Peter and I began this project, we were attempting to map out behavioral effects of pituitary and adrenal hormones well-known to be important in systemic stress reactions. Peter quickly found a behavioral response—he showed that animals exposed to a brief prestress would, 30 minutes later, begin to respond more rapidly to avoid a mild electric shock—and then showed this effect was quite responsive to adrenal hormones. But over the ensuing months, he ruled out every reasonable hormonal system that we thought might be influencing this effect. In time, we recognized that the behavioral phenomenon was a new one and that its hormonal basis was unique. Where this will lead, we do not yet know; the most recent results point most intriguingly toward the processes of memory.

CARL D. HOPKINS

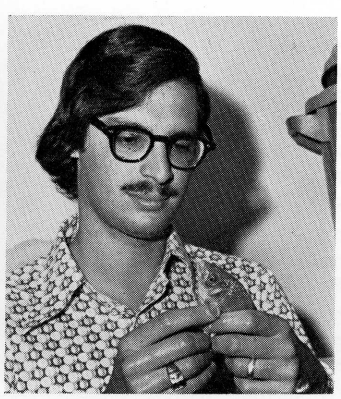
Peter R. Marler

Twenty years have passed since Hans Lissmann of the University of Cambridge discovered that certain fish continuously emit mild electrical signals so that they are surrounded by an electrical field. With a sensory system that monitors this field they can detect fish and other objects close by. In addition to functioning as an object-detection system, the electrical signals might, Lissmann suggested, also function in social communication. Although many attempts were made to demonstrate this, only when Carl Hopkins took the problem out of the laboratory and into the field—to study fish living under natural conditions—was the full potential of electrical communication realized. A major in physics and a minor in mathematics from Bowdoin College prepared him for dealing with the technical difficulties, but only preadaptation can be invoked to explain his success in setting up a field laboratory in the middle of the rainy season floods in Guyana, where he found these fish breeding. He was able to demonstrate the roles of electrical signals in the sexual and aggressive behavior of these fish. He worked out many properties of the system and made a case for lightning signals, detectable at great distances, as the major source of background noise against which the fish must perceive their electrical signals.

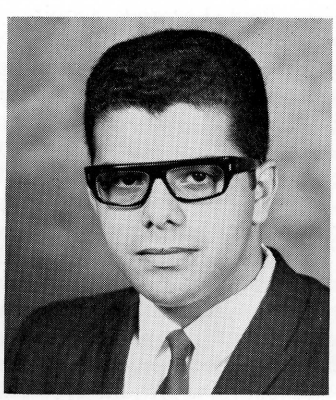


LAZAROW

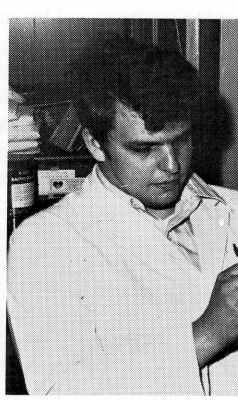
LEDBETTER



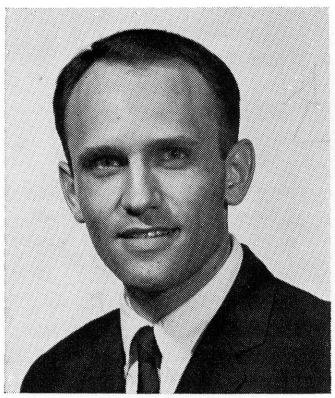
LEVINE



LIZARDI

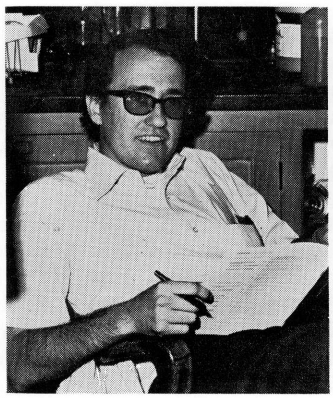


LUNDEEN



MARGLIN

NIST



SMITH

ZIGMOND

MICHAEL E. JUBIEN

Saul A. Kripke

Michael Jubien's interests at this University centered on the philosophical problem of ontology, as formulated by W. V. Quine: to what entities are we committed in an adequate scientific picture of the world? It is the philosopher's job to give a criterion for what entities the scientists force us to recognize—the "ontological commitment" of scientific theories. Common sense commits us to tables and chairs. Physics asks us to recognize molecules and electrons. Many philosophers have argued that mathematics commits us to a special realm of abstract entities —numbers, functions, and the like. In his thesis, Jubien attacks the problem directly. Following various earlier writers, he argues that Quine's criterion of ontological commitment, if made rigorous, cannot be given an extensional formulation of the type Quine himself would demand. He then uses the resources of modern modal logic, with a few modifications of his own, to formulate an intensional alternative. The resulting criterion is intricate and complex. For mathematics it yields the consequence that the mathematician is committed, not so much to a special realm of entities, as to structures. Michael Jubien's degree is the first awarded by this University in philosophy.

PAUL B. LAZAROW

Christian de Duve

During his five years at The Rockefeller University, Paul Lazarow acquired a large number of rather sophisticated skills which turned out to be necessary for answering what we had thought was a relatively simple and straightforward question: Where in the liver cell is the enzyme catalase synthesized; and by what pathway is it conveyed to its intracellular abode, the microbody or peroxisome? To solve this problem, Paul decided to use radioisotopes to label newly made molecules, centrifugal fractionation to separate cell components, and immunochemical precipitation to isolate the labeled enzyme. He did eventually succeed in doing all this but not without much hard and laborious toil. Now that the hardships are over, he has every reason to be pleased with the results. He has come up with a very pretty, and quite unexpected, answer to his problem. And he has, almost without being aware of the process, forged himself into the kind of hybrid combination of erudite scholar, incisive thinker, and resourceful jack-of-all-trades modern cell biology depends upon for its further progress.

MARY LEE S. LEDBETTER

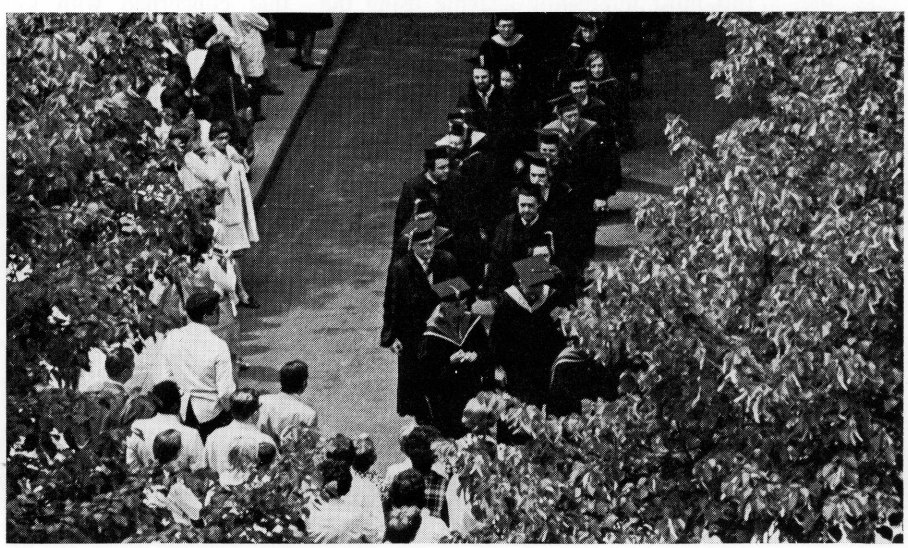
Rollin D. Hotchkiss

Mary Lee Stewart Ledbetter comes from a family that has shown both inward and outward respect for green plants and the natural world: inward respect shown in distinguished educational service in botany; outward expression shown by a naturalistic enthusiasm for plants and other healthy growing things. Coming to us from Pomona College, Mary Lee had already tried herself in summer apprenticeships at Western Reserve, Harvard and Caltech. She continued here the search for a subject biological in interest, yet modern in approach. One graceful sweep took her to Italy to do genetical research upon her emerging special interest—fine-structured genetic interactions in new organisms, the yeasts. Returning from the Old World, the Reconnaissance Woman had become scientifically a Renaissance Woman. Mary Lee plunged intensely into her chosen work. She narrowed her attention to the bewildering unstable "double genes" of pneumococcus. Out of the confusion of this topic she coordinated new knowledge and insight along several directions. She showed that the rate at which different doubly endowed bacteria rearrange themselves to produce single pure types is in the main determined by a built-in variable feature of their internal structure. She found that the rate does not respond to other influences which do essentially govern the rearrangements between inside and outside gene material.

MICHAEL W. LEVINE

Israel Abramov

Mike Levine came to Rockefeller in 1967 and soon joined the laboratory of Dr. Hartline and Dr. Ratliff. His research interests lie in the general area of sensory physiology and especially in the field of vision. For the past few years Mike has worked very closely with me on a wide variety of projects in this area. We completed a theoretical quantitative model of the responses of the primate nerve cells associated with color vision, as well as a study of the effects of carbon dioxide on the neural responses of the goldfish retina. Mike's thesis research involved recording the responses of single-gan-



glion cells in the goldfish retina and studying the spatial interactions within a cell's receptive field. The retina is enormously complicated and considerable processing of visual information takes place in the retina. The ganglion cells, whose fibers form the optic nerve, convey this information to the brain. The problem was to devise ways of inferring the order and nature of the transformations and interactions which must occur between the capturing of photons by the receptors and the responses of the ganglion cells. Mike developed a new set of mathematical methods for analyzing his data. Applying these to the experimental results, he was able to formulate a set of precise statements of the rules by which signals from different areas of a cell's receptive field are combined.

PAUL M. LIZARDI

(Degree granted *in absentia*)

The topic of Paul Lizardi's thesis was Studies on the Biogenesis of Mitochondrial Ribosomes from *Neurospora crassa*. His research adviser was David J. L. Luck.

CARL V. LUNDEEN, JR.

Armin C. Braun

Carl Lundeen's scientific researches were concerned with a study of the basic cellular mechanisms that underlie the problem of tumor progression. The question as to why "tumors may go from bad to worse," as Dr. Peyton Rous so vividly described this phenomenon, is as yet little understood in any system. Through a careful analysis of two tumor cell lines which represented a very early and a late stage of the transformation process, Carl succeeded in characterizing rather specifically the area of metabolism that is centrally involved in tumor progression in the system that he studied. He also succeeded in greatly narrowing a probable site of action of an essential growth-regulating hormone. In addition, Carl developed, in collaboration with Professor Frank H. Field, a method that is at least one order of magnitude more sensitive than any previously described for measuring the concentration of the ammonium ion in cells. These findings represent significant contributions to the furtherance of our knowledge in this very difficult field of research.

ARNOLD MARGLIN

Bruce Merrifield

Arnold Marglin came to Rockefeller University trained as a physician and with a genuine desire to help his fellow man. He felt the best way for him to help the most people was through the chemical approach to medical problems, specifically to diabetes mellitus and the role of insulin. Fortunately, the time was right to undertake the total synthesis of this small protein and to examine the relation of its structure to its function. Arnie learned the methods of peptide chemistry and soon began to apply his remarkable energy and talent to the synthesis of the two chains of insulin by the new solid-phase technique. The synthesis of the chains was successful, and their combination gave physiologically active insulin. Synthetic analogs were then used to define the role of cysteine in the promotion of glucose oxidation in fat cells by pure insulin A-chain.

CYNTHIA R. NIST

David J. L. Luck

Cynthia Nist was attracted to biology just before entering college when she spent the summer working in a medical research laboratory. She majored in chemistry at The University of Minnesota, but when she completed her undergraduate work she made two long-term commitments to life sciences—she came to Rockefeller University and she married a medical student. Choosing cell biology as a focus, she first worked in several of our laboratories learning basic techniques for studying cells and tissues. Then she selected the problem of mitochondrial biogenesis as a thesis topic. Cynthia pursued this subject with intensity, making good use of her chemical training. In her spare time—and there wasn't much—she became interested in training and showing sled dogs. Perhaps these macrobiological experiences balanced the more abstract nature of her microbiological laboratory experiences because as her experiments progressed from the cellular to the subcellular and then to the molecular, the population of Siberian Huskies in the student residence increased alarmingly. In any case, it is clear that Cynthia values biological goals as a focus for her work and that she is now well-equipped to undertake the study of such problems.

AMOS B. SMITH III

William C. Agosta

One of the currently most active and fruitful areas of chemical research is photochemistry—investigation of the behavior of molecules in electronically excited states. It was on this developing area that Amos Smith chose to concentrate attention during his years at the University. It appears to have been a most happy choice. Amos arrived here with a master's degree from Bucknell University and the experience of a year in medical school. He was ready in every sense to begin research at once and has worked hard, fast, and almost continuously ever since. This work has involved the preparation of specific chemical compounds and the investigation of their photochemical behavior. It has called for close interplay of synthetic and degradative chemistry with photochemical theory. Since both starting compounds and products are most frequently substances never previously prepared, the whole process requires mastery of a sizable array of chemical techniques. Amos has not simply done this well; he has done it with such real originality, insight, and enthusiasm that he has discovered several quite novel transformations and has considerably advanced our understanding of the photochemistry of ketones.

SALLY H. ZIGMOND

James G. Hirsch

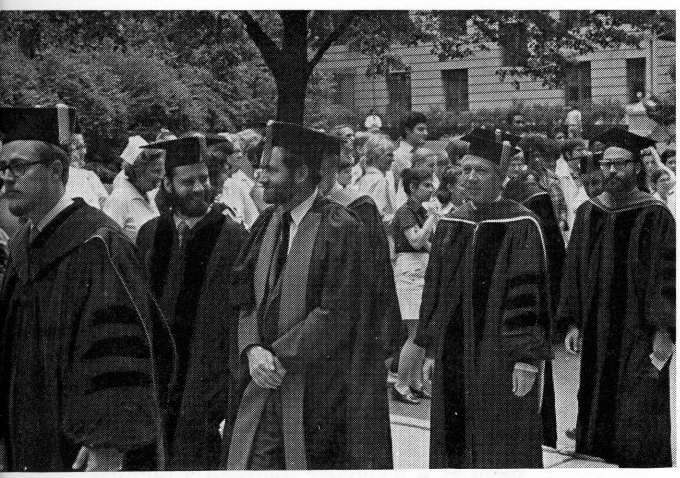
Sally Householder Zigmond's development at Rockefeller followed a familiar pattern: early years occupied with the exciting and broadening, but sometimes tedious, search for knowledge; then initiation into the mysteries of basic laboratory research in the middle years, filled with frequent frustration, disappointment, and feelings of inadequacy; and finally, a series of successful experiments and the development of expertise, judgment, and confidence—a remarkable blossoming into a full-fledged scientist more capable in her own field than her mentors. Sally's thesis research was concerned with the basic biological phenomena of locomotion and chemotaxis of cells—how cells move from place to place and how they are able to control the direction of their movement under certain circumstances. Most of her studies were done on white blood cells. She devised new methods for measuring locomotion and chemotaxis reliably for the first time. She established that damaged cells release a chemotactic substance which attracts nearby cells to the scene, a chemical communication system at the cellular level that has important and broad implications. She studied cytochalasin, a new drug that alters many cell functions, including locomotion, and she discovered that this substance blocks the transport of glucose at the cell membrane, a finding of great interest to cell physiologists.

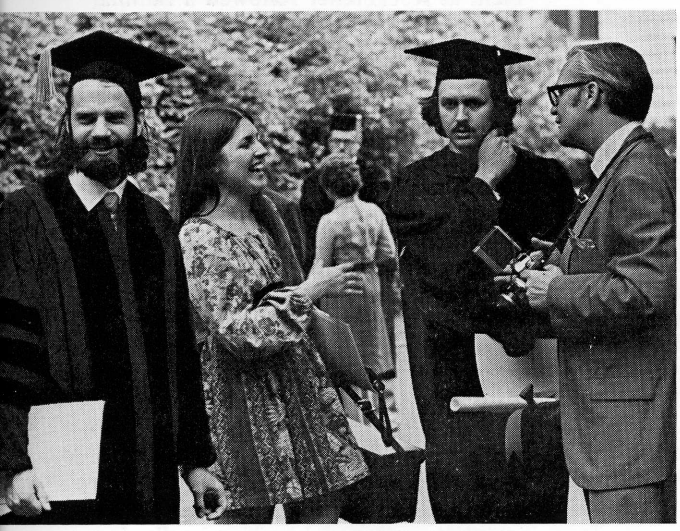
HONORARY DEGREES

KURT GÖDEL

Hao Wang

A theoretical man with intellectual talents of the highest order, Professor Gödel is concerned with nothing less than what is fundamental. He succeeds in attaining a level of accomplishment supreme in science, profound in philosophy, and noble in human relations. In the foundations of mathematics, his work gave rise directly or indirectly to most of the major developments during the past few decades. And his interest in foundational questions is by no means confined to mathematics. For example, he has done significant work in physics, namely the construction of rotating universes on the basis of Einstein's theory of gravitation.





Yet probably more of his energy has been devoted to fundamental philosophy than to science. Applications of his philosophy in conversations and in his published papers give evidence of a truly comprehensive and forceful grand structure, which has points of contact with the philosophies of Plato, Leibniz, and Husserl. In the human sphere, he is as meticulous in his dealings with people as in theoretical matters, and notably generous to his friends both of his time and of his knowledge. Those who are fortunate enough to come into personal contact with him are struck by his warmth, charm, and wit. The deep respect he enjoys among diverse groups is of a kind rare in the modern world. In a world of people very much competing with one another, he is above competition. Professor Gödel's work has revolutionized modern logic, greatly raising its level of significance both mathematically and philosophically. And mathematics and philosophy as done by him are exceptionally meaningful, beautiful, and free from rancor. His celebrated paper of 1931 on undecidable problems dealt a fatal blow to Hilbert's formalist approach to the foundations of mathematics. Moreover, this paper, supplemented by Turing's definition of computing machines, led to the surprising consequence that even in such restricted fields as the theory of Diophantine equations, no machine can decide all propositions.

ALFRED DAY HERSHEY

Norton D. Zinder

Alfred Hershey is an experimentalist extraordinaire. A graduate of Michigan State University, he started his career at Washington University in St. Louis. There he was responsible for describing an important attribute of antibodies—that a single antibody molecule has a single specificity; there are no heteroligating antibodies. In the middle 1940s, Hershey moved to the Cold Spring Harbor laboratories, where he is now director of the Genetics Research Unit of the Carnegie Institution of Washington. Hershey was the first to describe genetic recombination in bacteriophages, making them more like living organisms than the inanimate objects they seemed to be, and thereby opening them to the whole panoply of genetic analysis. He then turned to the chemistry of phage growth and in 1952 performed the experiment that turned the tide in our thinking to nucleic acids as genetic material. Hershey's further accomplishments relate to the physical structure of phage DNA molecules. With Thomas and Rubenstein he isolated phage T4 DNA in one piece, 130 million daltons of DNA. He showed that the smaller sizes usually seen were the result of shear during the preparation procedures, and he introduced the idea of using controlled shear to produce molecules of fixed sizes. Because of these findings one now thinks that even structures as large as chromosomes may contain a single polymer of DNA. When Hershey turned to phage lambda DNA, he noted the tendency of the linear molecules to cyclize. From this he inferred the existence of complementary single-stranded regions on the ends of the molecules. As predicted, these "sticky" ends have been found. This cyclization of viral DNA molecules provides an important clue as to how they might integrate into their hosts' genomes. Although Alfred Hershey has had no real students many of us consider ourselves such for, by example, he showed us what experiments should be like and how to think about them.

Future Plans

Where are the 19 new doctors of philosophy headed? Four will continue their researches on this campus. Most will scatter, some across a continent or an ocean.

Robert S. Anthony will serve as analytical chemist and biochemist with the family firm, RSA Corporation of New York State.

Dominica Borgese, educated in Florence and Paris before coming to Rockefeller, is returning to Europe to work at the Center of Cytopharmacology of the University of Milan.

Bruce A. Diner has been awarded a research fellowship by the Helen Hay Whitney Foundation and will work at the Institut de Biologie Physico-Chimique in Paris.

Thomas G. Easton will do postdoctoral research with Dr. Edward Reich on this campus.

Donald A. Elliott, an M.D. from Baylor who was a fellow in pediatrics at Johns Hopkins before coming to Rockefeller, has received a New York Heart Association fellowship and will continue his work here as assistant professor in the laboratory of Dr. Martin A. Rizack.

Nina V. Fedoroff has been named acting assistant professor at the University of California, Los Angeles. In addition to her scientific activities, she has been a Russian-English translator and a flutist with the Syracuse Symphony Orchestra.

David S. Forman has been awarded a postdoctoral fellowship at the National Institute for Mental Health, Laboratory of Neuropharmacology, Washington, D.C.

Peter O. Gray has been appointed assistant professor at Boston College.

Carl D. Hopkins will do postdoctoral research in the Department of Neuroscience of the University of California, San Diego.

Michael E. Jubien will assume the post of assistant professor of philosophy at the University of Massachusetts in Amherst. In the spring of 1970 he served as visiting lecturer in philosophy at Princeton University.

Paul B. Lazarow becomes a postdoctoral fellow in the laboratory of Dr. Alberto Monroy at the National Research Council (CNR) in Naples, Italy.

Mary Lee S. Ledbetter will receive postdoctoral training at the New York University Medical School next year in mammalian cell genetics and will proceed from there to further work at Dartmouth College.

Michael W. Levine has been appointed assistant professor in the psychology department of the University of Illinois.

Paul M. Lizardi is the recipient of a postdoctoral fellowship from the Jane Coffin Childs Memorial Fund for Medical Research. He will work in the Department of Embryology of the Carnegie Institution of Washington in Baltimore.

Carl V. Lundeen, Jr. will remain at Rockefeller as a research associate.

Arnold Marglin, who holds an M.D. from the Columbia University College of Physicians and Surgeons, has been appointed assistant professor at Tufts University, Massachusetts.

Cynthia R. Nist has been awarded a postdoctoral fellowship at the University of Washington in Seattle, where she will do research on the smooth muscle cells of the aorta, cells which may be involved in the pathogenesis of atherosclerosis.

Amos B. Smith III has been appointed a research associate at Rockefeller.

Sally H. Zigmond will work in England with Dr. Michael Abercrombie of Cambridge University with the support of a postdoctoral fellowship from the Leukemia Society.

BRIEFS

Carl Alper, supervisor of shipping and receiving in the Purchase and Supply Service, received a bachelor of arts degree in Romance Languages this May from Lehman College. Mr. Alper, who is 54, had been working off-hours toward his degree for six years.

Professor **Donald W. Pfaff** presented a paper on Electrophysiological Effects of Gonadal Steroids on the Brain: Analysis of Hormone-Sensitive Circuits, at the International Congress of Endocrinology, in Washington, D.C., June 23.

Professor **Bruce Merrifield,** Biochemistry, was awarded an honorary doctor of science degree from Newark College of Engineering on June 2.

Professor **Philip Siekevitz,** Cell Biology, was a symposium speaker at the Eighth International Conference on Mechanisms in Bioenergetics held in Pugnochiuso, Italy, May 1–4.

Eugene H. Kone, public relations associate, was elected to the executive committee of the National Association of Science Writers at the association's annual meeting on June 18.

Professor **James A. Shannon,** Biomedical Sciences and special assistant to President Seitz, received an honorary doctor of science degree from Harvard University on June 15.

Professor **Edward L. Tatum,** Biochemical Genetics, delivered the dedicatory address for the Paul V. Galvin Life Science Center of the University of Notre Dame on April 28.

Professor **Abraham Pais,** Theoretical Physics, lectured at a symposium on elementary particle theory held May 16–18 in Tashkent, U.S.S.R.

Professor **Saul A. Kripke,** Philosophy and Mathematical Logic, has been invited to be the John Locke Lecturer at Oxford University. The John Locke lectures are presented once every two years by a distinguished non-British philosopher chosen by the entire philosophy faculty of Oxford. Dr. Kripke is the third in succession to be so honored while a member of the Rockefeller faculty. Professor Donald Davidson was the lecturer in 1970, and Dr. Sydney Shoemaker, now at Cornell University, delivered the lectures this year.

For Dubos, Many Honors and Another Busy Year

This has been another busy year for Professor René J. Dubos. It has encompassed a United Nations assignment which led to the publication of his newest book, several distinguished awards, an honorary degree, and an international prize of $50,000.

In May 1971 Dr. Dubos was asked to serve as chairman of a group of 152 of the world's leading experts on environment, representing 58 countries, who cooperated in the preparation of background material for a report to the United Nations Conference on the Human Environment. That report, which Dr. Dubos coauthored with the distinguished British economist and journalist Barbara Ward, who holds the Albert Schweitzer Chair at Columbia University, was presented to the conference held in Stockholm last month. It has been published for general distribution in English, French, German, Spanish, Italian, Japanese, Swedish, Danish, Dutch, and Arabic. The title of the American and British editions, in hard-cover and paperback, is *Only One Earth: The Care and Maintenance of a Small Planet.* It is a Book-of-the-Month Club selection for June. Plans are under way for the use of the proceeds of the book to establish environmental study programs for elementary schools.

On April 18 Dr. Dubos was presented the medal of the American Society of Planning Officials in recognition of "a career of significant contributions to the field of planning," and

on the same day he was awarded the Frances K. Hutchinson Medal of the Garden Club of America for "exceptional service in the field of conservation." On May 23 he received an honorary degree from Catholic University in Washington, D.C.

On May 3 a cable from France informed Dr. Dubos that the international jury of the Institut de la Vie, comprising 52 members from 29 countries, had voted him its first $50,000 award, sponsored by the French electricity system. This award pays tribute to nearly 50 years of Dr. Dubos's work in microbiology and pathology, and more recently on the social, psychological, and medical aspects of environmental science.

Professor **H. Keffer Hartline,** Biophysics, has been serving since March 1 as George Eccles Professor in physiology at the University of Utah, where he will remain through August 31. He is the first to fill the chair established in 1970 "to attract distinguished scholars, educators, and researchers" to the University of Utah.

Professor **Carl Pfaffmann,** Physiological Psychology, received an honorary doctor of philosophy degree from Yale University on June 12.

Warren H. Munroe, manager of safety and security, presented a paper at the National Safety Council's 19th National Conference on Campus Safety held at Brown University on June 28. His subject was design engineering and the operation of a laboratory safety program.

STUDENT COMMITTEE ELECTION

The Student Representative Committee has announced the result of a recent election. The new representatives are Efrain Azmitia, Carl Beyer, Robert E. Hendrick, Gary Hoffman, Margaret L. Jones, Darcy Kelley, Lee Rubin, and Abraham Snyder. A Housing Committee of two, Michael Draper and James Rand, was also elected.

SUMMER HIATUS

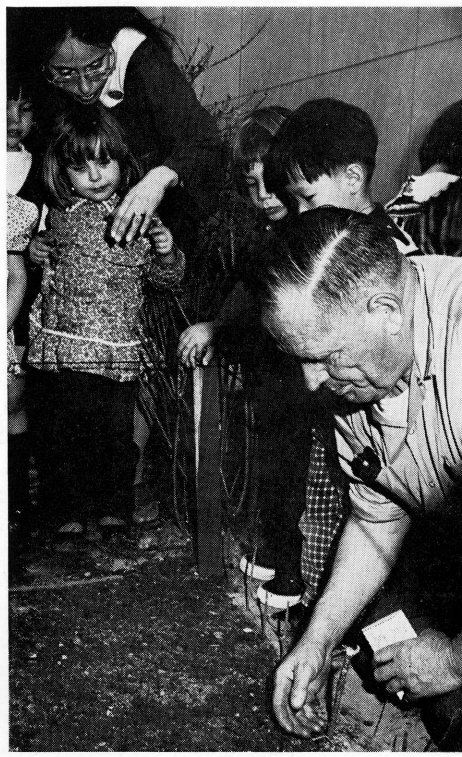
Following this convocation issue, dedicated to happy endings and promising beginnings, *news and notes* takes its summer hiatus, but we look forward to receiving—by mail or by phone—any news items you may have. Publication will resume in October.

Dole Reports on Programs and Plans

In the 16 months since he gained permission to set up a methadone detoxification program for heroin addicts in the city's detention prisons, Dr. Vincent P. Dole reports, more than 30,000 treatments have been administered. Dr. Dole sought permission because methadone offers the most humane form of detoxification, reducing suffering, tension, and violence. Detoxification, however, is a short-term process which does not cure addiction. Most addict-prisoners resume their habit when they are released. Many of the 30,000 treatments represent repeaters.

Last fall Dr. Dole initiated a follow-up program to help prisoners get off the not so merry-go-round of addiction, incarceration, detoxification, release, addiction. Working with the Beth Israel Medical Center's Methadone Maintenance Treatment Program, he set up a small demonstration clinic in Harlem. Selected prisoners were given either a pretrial release or a trial deferment. Those already convicted were granted probation. All were placed under the clinic's care. After six months 75% of the 340 addicts treated remain stabilized on methadone maintenance (which, unlike detoxification, is ongoing), and are receiving therapeutic and occupational counseling and housing aid. In a parallel approach to this problem, the probation office, with Dr. Dole's help, has set up a number of comparable facilities in the city, and more are planned.

This past May Dr. Dole reported on his recent activities to the Middle Atlantic States Conference of Correction. He also addressed the Institute of Medicine, in Washington, D.C., on the overall question of medical responsibility in relation to crime. At that meeting plans were proposed for a research group, sponsored by the Institute of Medicine and the National Academy of Sciences, that will study crime as a disease and will make recommendations which, it is hoped, will help society provide better correctional care.



No spot (or tot) is too small for the nurturing touch of Head Gardener Andreas van Zadel, here initiating students of the Children's School into the mysteries of seed and soil.

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RPI Honors Bronk

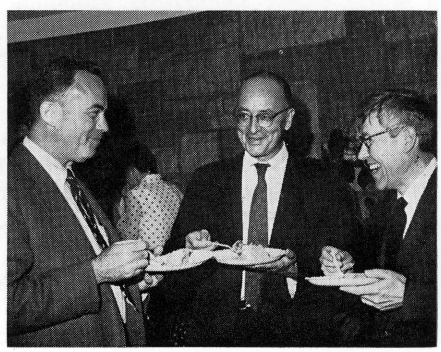
On May 13 Rensselaer Polytechnic Institute dedicated the Detlev W. Bronk Bio-Science Laboratory, the last of seven buildings to be constructed on the Troy campus during the six years, 1965–71, when Dr. Bronk served as chairman of the Rensselaer board of trustees. A bronze plaque, mounted at the entrance, cites Dr. Bronk as "renowned scientist, educational leader, counselor to presidents and governors, wise and influential in the development of science and technology throughout the world, warm friend of students and faculties. . . ."

A farewell party at the Hospital on June 14 paid tribute to Olive G. Haley (left), leaving to relocate in Georgia, and Anne N. Clune and Katherine Clausen, both retiring.

IN PRINT

The April 28 issue of *Science* contains two articles by members of the Rockefeller community. "A National Focus of Science and Research" by President Emeritus **Detlev W. Bronk** is based upon an address he delivered at the dedication of the completed building of the National Academy of Sciences in April 1971. In the piece Dr. Bronk, who served as the academy's president from 1950 to 1962, traces the architectural history of the academy over the past 50 years. In the article "Applied Research for the Public Good—A Suggestion," Affiliate **Harold Gershinowitz,** Physical Chemistry, offers a detailed argument in favor of using the methods by which research is applied to technology for seeking solutions to today's pressing social problems.

Scientific American for June contains two articles by Rockefeller researchers. In the issue's cover story, "Contour and Contrast," Professor **Floyd Ratliff** discusses the neural mechanisms underlying the effects whereby contours make large areas appear lighter or darker than they really are. Illustrating the piece are optical-illusion photographs and diagrams as well as examples of paintings which show how well artists of the past observed this phenomenon. In "Psychological Factors in Stress and Disease," Professor **Jay M. Weiss** details his recent work in which he separates the physical and psychological factors involved in the development of stomach ulcers and other disorders in rats, and reveals the prominence of the psychological factors.



Frank Brink, Jr. (center), who resigned as dean of graduate studies on June 31, was honored at a party sponsored by the Student Representative Committee on June 12. Dr. Brink, who had served as dean since the creation of the post in 1957, now wishes to devote more time to research. Shown with him above are James G. Hirsch (left), who succeeds him, and Associate Dean Clarence M. Connelly.

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