7-1974

NEWS AND NOTES 1974, VOL.5, NO.10

The Rockefeller University

THE ROCKEFELLER UNIVERSITY

JULY 1974
VOLUME 5 NUMBER 10

news and notes

Fifteen Receive Degrees at Sixteenth Convocation

Fifteen young men and women received the doctor of philosophy degree at the University's 16th annual convocation, held on Wednesday, June 12. Tribute was also paid to Sir Alan Hodgkin of Cambridge University, a 1963 Nobel Prize winner, who was awarded an honorary doctor of science degree. Ceremonies were held in Caspary Auditorium before an audience of family, friends, and colleagues of the recipients. Among them was a specially honored guest, Mrs. Peyton Rous, widow of the University's esteemed Nobel laureate and the mother-in-law of Dr. Hodgkin. Participating as usual in the convocation was David Rockefeller, chairman of the board of trustees, who attended on crutches as the result of a recent injury.

Alan Lloyd Hodgkin, John Humphrey Plummer Professor of Biophysics at Cambridge University and president of the Royal Society, shared the Nobel Prize in physiology or medicine for his research into the physical origins of the nerve impulse and the phenomenon of "excitability." In presenting him, Professor Alexander Mauro said, "From the very outset his main thrust was to establish that the action potential, the electrical sign associated with the neural impulse, was more than just an indicator of the nerve impulse propagating along the nerve fiber. In fact, as subsequent experiments showed, it was the crucial physical agent in its propagation." For four decades, said Dr. Mauro, "students of excitability have turned to Hodgkin's papers as a source of uniquely significant developments in this field." Dr. Mauro also reminded the assemblage that Sir Alan is no stranger to this campus. In 1937, he was invited by President Gasser to the then Rockefeller Institute for a year of research. During that period, Dr. Hodgkin met Marion Rous, daughter of Dr. and Mrs. Rous, whom he subsequently married. In recent years, in addition to continuing his research in the field of excitability, Professor Hodgkin has also been studying the biophysical mechanism underlying the response of the photoreceptor membrane to light.

In keeping with the University's tradition, each of the Ph.D. recipients was presented to President Seitz by a faculty member with whom he or she worked closely.

The ceremonies were followed by a reception on the 17th floor of the Tower. The Convocation Ball was held the same evening, also in the Tower.

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

PH.D. DEGREES

ARTHUR P. ARNOLD

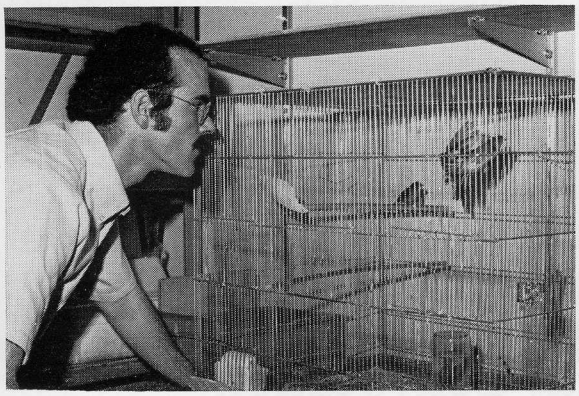
Fernando Nottebohm

Birdsong lends itself particularly well for integrating the interests and techniques of ethology and the neurosciences. Art Arnold focused his interests on the hormonal correlates which accompany song learning in *Poephila guttata,* the Australian zebra finch. He discovered that testosterone is not necessary for song learning to occur; however, castration reduces the amount of singing and slows down the tempo of song delivery. With the help of Donald Pfaff, Arnold has also found anatomical sites where testosterone may be exerting its effects on song. Following injections of radioactive testosterone, radioactive material is concentrated in large amounts by the nucleus intermedius of the medulla. This nucleus supplies the motor innervation to the bird's vocal organ, the syrinx. The motor neurons of this nucleus are just one synapse removed from the muscles they innervate, and thus offer a rather unique chance to study the effects of testosterone on neuronal performance. Art will stay at this University as a postdoctoral fellow. With the help of Professor Hiroshi Asanuma he intends to study the testosterone-induced infatuations of syringeal motorneurons.

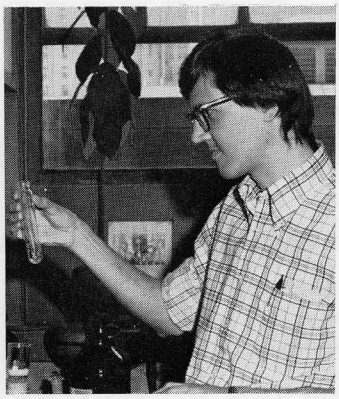
CARL F. BEYER, JR.

William A. Gibbons

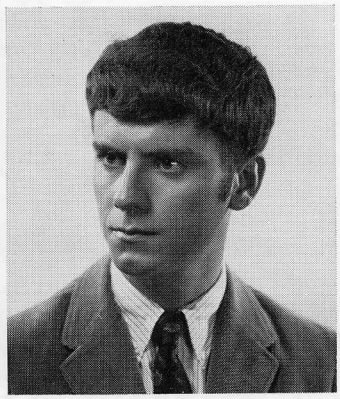
Carl Beyer was admitted to this University following an excellent undergraduate record at Bellarmine College, Kentucky. He chose to investigate the physical



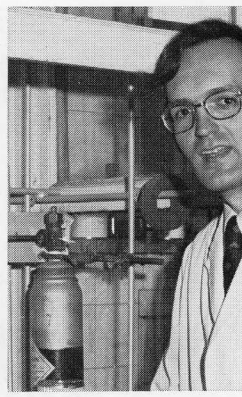
ARNOLD



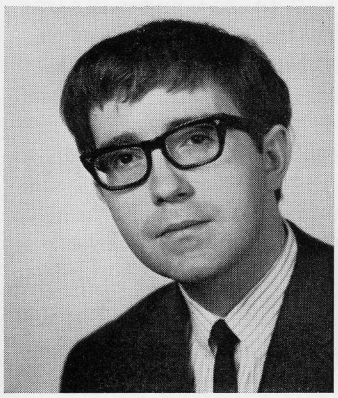
BEYER



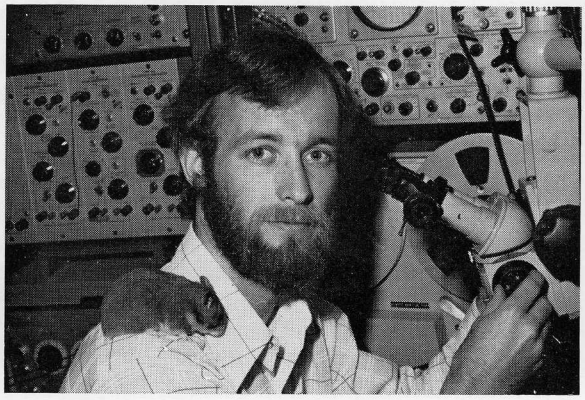
CASTLE



DRAPER

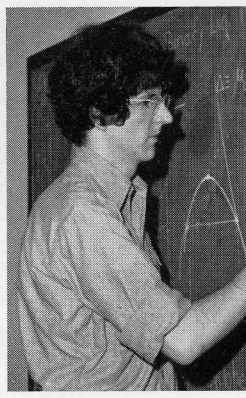


FARRELL



FLOODY

GREENWOOD



KINCAID

chemistry of biological molecules under the direction of Professor Craig and myself. For his first project he chose fundamental investigations of biomolecular probes. These are small molecules which are used to study structure, motion, and surface properties of proteins and cell membranes. Carl showed that these probes attach themselves primarily to positively charged groups. His paper was quoted by a reviewer as a highlight in this field. For the main part of his thesis, Carl again chose fundamental biophysical research. Proteins and peptides are large biological molecules built up by joining small molecules called amino acids. To measure the distance between two of these amino acids in the chain is a very important problem. For many years physical chemists have used a technique called photoluminescence. Essentially this involves absorption of light at one amino acid and measuring the extent and characteristics of its reappearance at another amino acid along the chain. By careful experimentation Carl not only produced a significant contribution to our knowledge of the shape of the molecule of his choice, but also was able to test the precision of this photoluminescence technique.

J. DAVID CASTLE

George E. Palade

At Rockefeller, John David Castle joined our cell biology laboratory to work with Dr. Jamieson and me on the membranes of cell compartments involved in secretion in glandular cells. For good reasons, he chose a salivary gland, the parotid, as object for his experiments, and in two years completed and published a radioautographic study on the intracellular transport of secretory proteins in parotid acinar cells. It had taken us six years to work out the same problem, for the first time, in the pancreas. The time difference is in good part a measure of David Castle's experimental skill. His next move was to isolate in a distinct fraction the secretion granules of the parotid's cells, and—starting from this fraction—to separate the contents of the granules from their membranous containers. Through David Castle's work, we became aware of the extent to which such membranes are contaminated by adsorbed proteins, and we learned what means must be used to distinguish between contaminants and bona fide membrane components. Once the distinction was established, David Castle used his system to compare the rates at which the cell synthesizes the content and the containers of its secretory granules. It turned out—as expected from a resourceful and time-tested organization, from an expert in survival—that the cell does not practice waste economy. Here again, David Castle's work could be considered a model, which shows at what level of resolution and precision this type of inquiry must be carried out to give unambiguous, reliable results.

MICHAEL W. DRAPER

Bruce Merrifield

When Michael Draper selected The Rockefeller University for his graduate studies he was attracted by the freedom to chart his own course. His goal was to combine a background in chemistry with an interest in physiology and endocrinology. Mike has effectively guided himself along such a path by learning the techniques of peptide chemistry and applying them to a structure-function study of the hormone ACTH. This has resulted in a joint association with the laboratory of Martin Rizack and in collaborations with other university and industrial laboratories of endocrinology. Mike has been able to define the role of certain parts of the ACTH molecule in the action of the hormone and has synthesized a new derivative that is even more active than the parent hormone itself. After two years Mike extended his horizons; this time to enroll in Cornell Medical School. He thus became a forerunner to the joint M.D.-Ph.D. program of the two institutions. It has been amazing to see how his output has increased to meet the new demands of his expanding interests.

DANIEL FARRELL

Joel Feinberg

Daniel Farrell came to The Rockefeller University with a strong background in the philosophy of mind and an interest in the philosophical implications and presuppositions of the behavioral sciences. After a productive first year, he got caught up in the political events of the time and turned his attention to a set of deep problems in moral and political theory. In the course of his very thorough dissertation, he considers the nature,

ground, and limits of our moral obligation of obedience to the state, and then argues ingeniously against the view suggested by Socrates (in Plato's dialogue *Crito*) and held by a large majority of philosophers since, that a willingness to accept punishment is among the conditions of justified civil disobedience. His argument then leads him into an examination of the leading theories of the justification for criminal punishment, and finally to some practical suggestions about how an exculpating defense of conscientiousness might be incorporated into the law.

OWEN R. FLOODY
Donald W. Pfaff

Owen Floody came to our lab with an interest in studying the physiological basis of social behavior in animals. After thinking carefully about what kinds of experimental situations he might be able to analyze, he settled on studying aggressive behavior in female hamsters. These animals fight readily throughout most of their reproductive cycle, but during their period of sexual receptivity they are not aggressive at all. Owen wanted to study the hormonal basis for these fluctuations in aggressiveness. First of all, he carefully described the structure and sequence of the aggressive responses themselves. Then he showed that high levels of aggressive responses occur in hamsters which have low levels of ovarian steroid hormones in the blood. Injections of the ovarian hormones estradiol and progesterone, in combination, prevented the appearance of aggressive responses. By working with hypophysectomized hamsters Owen found that estrogen and progesterone are likely to act directly on the hamster brain, rather than on the pituitary, to inhibit aggressive behavior. In the course of his work on hormones and aggression, Owen discovered that hamsters make high frequency sounds which signal information about their endocrine state and social intentions to other hamsters.

MARY RITA GREENWOOD
Jules Hirsch

We have learned that fat is stored in fat cells or adipocytes and that obese man has an excess of such cells, possibly determined by very early or infantile events. Mary Rita Greenwood has made meticulous studies of the sequence of events that occur in the tissues of infant rats as they develop adipocytes. At first, cells multiply and contain little or no fat. This multiplication ceases at weaning, but cells fill with fat beginning before weaning and continuing through the adolescence of the animal. But only when multiplication is still in progress can we affect the ultimate number and hence the fatness of the animal. Mrs. Greenwood has made the important finding that there are times when a pool of cells destined to become adipocytes is present and awaiting fat filling. Thus, long before the animal becomes obviously fat the cellular precursors for fatness are present and efforts to prevent fatness must be made exceedingly early in life. Her studies have given us an important blueprint of the developmental sequence in animal adipose tissue. With this information in hand, she, we, and other investigators can proceed to study these events in other animals and eventually in man.

JOHN M. KINCAID
E. G. D. Cohen

One phase consisting of two liquids mixed homogeneously at high temperatures may, below a critical temperature, demix into two coexisting liquid phases with different concentrations. At the critical temperature these two liquid phases become identical. In 1926, Kohnstamm suggested that three-component liquid mixtures should exist, where at a certain temperature—now called the tricritical temperature—three phases become identical. Many other systems have since been discovered that exhibit a similar tricritical temperature: certain antiferromagnet compounds or liquid mixtures of the helium isotopes He^3 and He^4. John Kincaid has investigated theoretically the analogy between these magnetic systems and the helium mixtures, in particular around their tricritical temperatures. This work has not only been successfully completed but has led to the study of a new type of critical point. It has also made John into a confident and very competent physicist. I have enjoyed collaborating with him very much.

JUDY LIEBERMAN
Abraham Pais

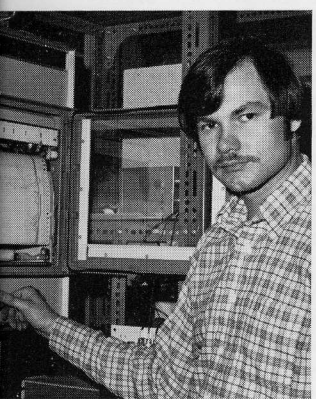
Just as, about a century ago, electric and magnetic phenomena merged into a grander design called electromagnetism, so we are now witnessing serious beginnings toward a still greater unification of the fundamental forces. The time is at hand, we think, for a union of electromagnetism with the "weak" forces whose more commonly known manifestations are seen in β-radioactivity. We are currently quite busy testing this novel approach in terms of simplified models and trying to develop new theoretical tools. Judy's Ph.D. research is in this exciting area. She was the first to work out a simplified model in which it is possible to compute both the proton-neutron and the charged vs. neutral pi-meson mass difference. *N'en déplaise* its preliminary character, this good work shows promise, and it has been widely taken note of by the aficionados. During her stay at Rockefeller Judy has developed from a *summa cum laude* "Cliffy" to a promising professional. If she trusts herself as much as I trust her then we will see more good things from her in the years to come.

JONOTHAN LOGAN
Mark Kac

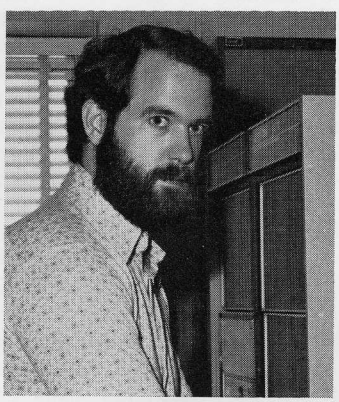
Fluctuations are deviations from the average governed by laws of chance, and they owe their existence to the molecular

LIEBERMAN

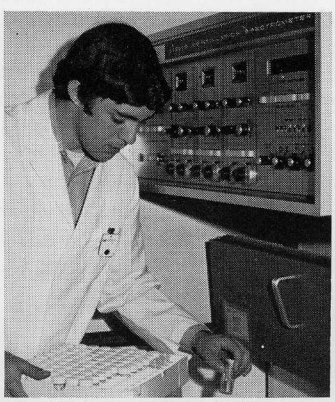
RABIN



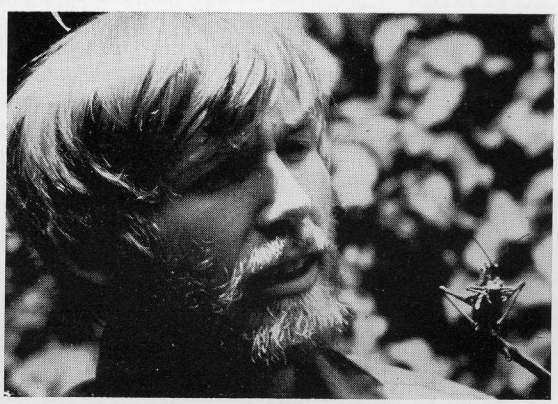
THUNBERG



TUTTLE



UNKELESS



WASER

structure of matter. Though utterly capricious and, in general, terribly small, their effect can be dramatic. The blueness of the sky, for example, is the result of density fluctuations in the atmosphere. How to analyze fluctuations and how to modify the phenomenological equations to take fluctuations into account is a central problem of statistical physics. At and near equilibrium there are general recipes of how to do it. The recipes are largely *ad hoc,* and Jonothan Logan attempted to provide a deeper justification for them. By studying two admittedly simplified models he has shown on the basis of subtle probabilistic analyses that the recipes are indeed correct. Unlike most young scientists Jonothan is also greatly interested in the history of his subject, and his dissertation contains many important and valuable historical facts and insights. Last but not least, Jonothan has taken deep and active interest in much of the work in molecular biology which goes on on this campus. Rumor has it that he even, under the cover of the night, sneaks into a laboratory occasionally and performs an experiment.

AARON RABIN

Victor J. Wilson

The organ of equilibrium, or labyrinth, exerts a variety of effects on the body musculature. For his thesis, Aaron Rabin studied the relation between labyrinth and spinal cord in the pigeon. One question he asked was whether the organization of the vestibulospinal system of birds is different from that seen in well-studied terrestrial animals, such as the cat, and whether it reflects the special demands placed on the labyrinth by flight. Aaron carried out a series of difficult, technically demanding experiments and discovered that in the pigeon, just as in the cat, the main target of the labyrinth is the neck and its main role therefore is to maintain the orientation of the head. We still debate whether this makes the pigeon a flying cat, or the cat a pigeon without wings. Whatever the answer, his years of study have made Aaron into a knowledgeable, skilled neurologist. As many of you know, the University recently started an M.D.-Ph.D. program with our neighbors across the street. Aaron was somewhat ahead of us, and his program is broader. The first phase of his studies was not only scientific but also led to his ordination as a rabbi. He then entered the Albert Einstein College of Medicine, but withdrew after his preclinical years to enter our graduate program. Because his interests tend towards complex aspects of motor control and problems that are clinically related, he will now be returning to Albert Einstein to obtain his M.D.

ALLEN L. THUNBERG

Richard M. Krause

Allen Thunberg's attention at Rockefeller was first directed toward microbiology. But in subsequent months he was drawn to immunology. The immune system modulates processes of both health and disease, including the defense mechanisms against the microbes of infection. Infectious diseases, often fatal, have always been part of the everyday experience of life. The many different antibodies that occur in animals and man minimize the ill effects of these diseases, from the common cold to meningitis. Although the general design of all antibodies is known, the mechanism which generates a large panel of many different antibodies remains a mystery. In some way an assembly line is programmed and directed to synthesize all these different antibodies, just as the assembly line for Chevrolets is directed to fashion Impalas, Belairs, and so on—but all with the same chassis and frame. Al has puzzled over the genetic mechanism which generates antibody diversity and, with experimental skill and imagination, he has identified the interplay among several of the genes that code for the antibody structure. Combining biochemical and genetic techniques, he has examined homogeneous antibodies from inbred rabbits in a search for the structural elements of an antibody that can be identified as products of specific genes. In this search he has had to determine the primary amino-acid sequence of specialized segments of many different antibodies. He has succeeded in this task and identified a new genetic marker and employed this in genetic studies.

JOHN R. TUTTLE

Floyd Ratliff

Properly speaking, the retinas of our eyes are part of the brain, for the retina grows out from the brain in its early development and always remains connected to it by the optic nerve. Not surprisingly, the retina has some functions that we ordinarily ascribe to the brain: the ability to discriminate among stimuli and to make abstractions. Thus, in a very real sense, the retina has a certain logic of its own. John Tuttle, who did his undergraduate work in applied mathematics at Brown University, chose to study some of these logical operations of the retina. In his research here at Rockefeller, John has shown how certain retinal ganglion cells abstract information about movement and variations in intensity in the pattern of light imaged on the retina and then report that information, via the optic nerve, to the brain. His thesis research is an important contribution to our knowledge of the physiology of the nervous system.

JAY C. UNKELESS

Edward Reich

For his thesis research Jay Unkeless began to explore a phenomenon first discovered here by Carrel in 1911; this was the observation that cultures of malignant tissue dissolved clotted blood plasma. About 1925 it was first shown convincingly that while practically all malignant cells dissolved such clots, normal cells did not. However, this difference between the two cell types was never analyzed. Unkeless reproduced the original observations and demonstrated that the ability to lyse clots appeared when cells were transformed to malignancy either in culture or in animals. Together with Annette Tobia he found that this property depended on the interaction of two protein factors: one factor is present in an inactive form in the blood of animals and man, and the other is released by tumor but not by normal cells. Unkeless purified the tumor cell factor, identified it as a potent and specific enzyme, and showed that it functions to activate the serum factor for clot lysis. This appears to be the first general and reproducible enzyme change associated with malignancy, and it is certainly the first for which the responsible molecules have been isolated and identified. In collaboration with Professor Zanvil Cohn's group, Unkeless recently found that the same enzyme probably also appears in the course of tumor formation by foreign materials such as asbestos. Extensions of this work by other members of the laboratory show that the enzyme accounts for several of the characteristic properties of tumor cells. It is too early to say what the ultimate applications of Unkeless's work might be. Despite this, and even in the present era of inflated claims, we can recognize it as a milestone in cancer research. From present indications it appears certain to lead us to fundamental new insights about the nature of malignant change.

PETER WASER

Peter R. Marler

Peter Waser began his scientific career in physics at Stanford University, and gradually shifted his interest to sensory physiology, pushed in a behavioral direction under the tutelage of Professor Griffin, finally to discover his métier in field studies of the behavior and ecology of monkeys. The conversion took place on a field class in Africa run by Professor Thomas Struhsaker, who has advised him extensively on his research. Peter developed a deep interest in the behavior of primates, how their societies are organized, how they relate to ecology, and what kinds of communication mechanism are involved in maintaining their structure. With the help of his wife, Mary Sue, he discovered unexpected degrees of group spread and mobility in troops of mangabeys, forest monkeys in Uganda. Systematic and painstaking observations on feeding behavior analyzed by computer back in the laboratory suggest the ecological underpinnings of mangabey society. He conducted the first successful playback of recorded vocalizations with primates in the field, showing how calls function in maintaining the spacing of troops in the forest,

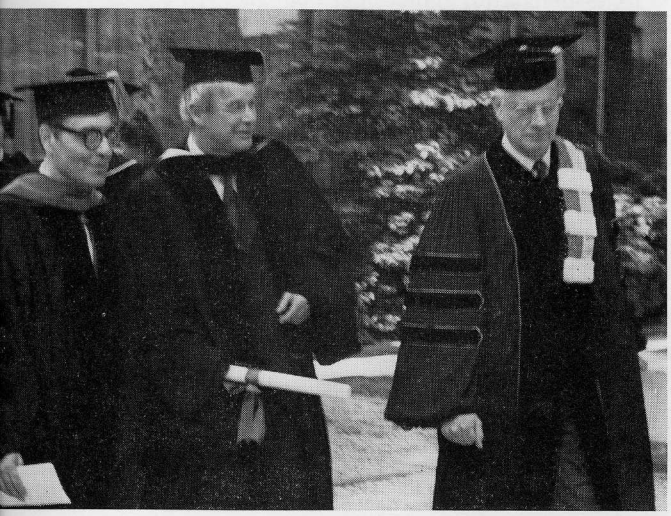
thus broaching a new era in the analysis of primate communication. The studies were arduous, and doubly so because of their coincidence with political upheavals in Uganda. But the Wasers persisted and are now enthusing about a return visit.

HONORARY DEGREE

ALAN LLOYD HODGKIN

Alexander Mauro

Upon entering Trinity College, Cambridge, in 1932, Alan Hodgkin came under the influence of three fellow members—Adrian, Hill, and Rushton—whose research was concerned with various aspects of nerve physiology. This association proved very stimulating and directed Hodgkin toward his own outstanding research into the physical origins of the nerve impulse. Indeed, in the ensuing four decades students of excitability have turned to Hodgkin's papers as a source of uniquely significant developments in



Left to right: Professor Alexander Mauro, Sir Alan Lloyd Hodgkin, President Seitz.

this field. From the very outset his main thrust was to establish that the action potential, the electrical sign associated with the neural impulse, was more than just an indicator of the nerve impulse propagating along the nerve fiber. In fact, as subsequent experiments showed, it was the crucial physical agent in its propagation. In 1936, the important discovery by J. Z. Young of the giant axon in squid provided, because of the axon's large dimension, the ideal biological preparation for a series of fundamental experiments by Hodgkin and his colleagues that elucidated the electrical nature of the action potential. These have since become famous as the "voltage-clamp experiments." Beginning in 1939, two groups working in close communication on both sides of the Atlantic—Cole and Curtis in Woods Hole, Massachusetts, and Hodgkin and Huxley in Plymouth, England—discovered that the potential across the squid axonal membrane not only fell but reversed in sign during the action potential. World War II compelled Hodgkin to direct his talents to radar research. After the war, however, Hodgkin and his colleagues were able to exploit fully the implications of their exciting discovery. Employing the voltage-clamp electronic feedback technique —introduced by Marmont and Cole— Hodgkin, Huxley, and Katz discovered, in 1949, an important new principle of excitable membranes; namely, the action potential in the squid axon emerges from the presence of two principal ionic electrical currents acting sequentially, one of them the sodium current and another the potassium current. These studies showed that the permeability of the cell membrane, both to the sodium ion and to the potassium ion, is exquisitely sensitive to the magnitude of the potential difference across the cell membrane. They succeeded in developing a mathematical description of these permeability changes which provided an elegant quantitative reproduction of the action potential in close agreement with that measured in an axon. For this fundamental contribution to our understanding of excitability phenomena, Hodgkin and Huxley were awarded the Nobel Prize in 1963. In more recent years, while president of the Royal Society, in addition to his continuing research in the field of excitability, Professor Hodgkin has devoted himself to the study of the biophysical mechanisms underlying the response of the photoreceptor membrane to light. In honoring him today we remind ourselves that Professor Hodgkin is returning to familiar surroundings and old friends, a connection that began in 1937 when he was invited by Dr. Herbert Gasser to spend a year of research in his laboratory. In *The Rockefeller University Review* of November-December 1966 is a photograph, taken in Stockholm when Dr. Peyton Rous was awarded the Nobel Prize, which shows Professor Hodgkin in the background gazing with affection and admiration at the recipient. We can enjoy the charming history behind this scene best by quoting from an autobiographical sketch of Professor Hodgkin which I found in a volume entitled *The Nobel Prizes of 1963:* "While at the Rockefeller Institute in 1938 I met Peyton Rous, the distinguished pathologist, and got to know his family. His daughter, Marion Rous, and I were married in 1944, while I was on a brief war-time visit to America." And so we see that his ties with us are not only those of an esteemed guest but also those of an esteemed son-in-law.

Physicists Report on Major New Experiment

A team of physicists from Rockefeller University, the Brookhaven Laboratory, and the U.S. Fermi National Accelerator Laboratory reported this month on a new experiment in which protons and neutrons—the basic constituents of atomic nuclei—were bombarded with six different types of very high energy subnuclear particles. The results indicate a surprisingly systematic character of the interaction of the fundamental particles of matter at high energies.

The new measurements were made with the world's largest accelerator, recently dedicated at the Fermi Laboratory in Batavia, Illinois, in which 300 GeV protons strike a stationary nuclear target. (One GeV equals one billion electron volts.) Beams of many types of subnuclear particles with energies up to 300 GeV emerge from this target. The six varieties of particle beams which were used included protons, antiprotons, positively and negatively charged pi-mesons, and positively and negatively charged K-mesons. The measurements allow a precise comparison of the interaction probabilities of each of the six different strongly interacting probe particles with the proton and neutron. These interaction probabilities are usually referred to as effective areas or "total cross sections" of the proton and neutron. These precise measurements, with an accuracy of about one part in 500, reveal that the effective size of both the proton and neutron increases for five of the six probes when their energy is increased from 50 to 200 GeV. For the sixth, the antiproton, the rapid decrease in size previously observed below 50 GeV has dramatically slowed, and the apparent size becomes essentially constant between 150 and 200 GeV. The similarities and the comparisons of the behavior of the cross sections with the six probing particle beams indicate that a new simplicity of nature may be revealing itself at very high energies—a situation which had been predicted by some physicists. Since the proton and neutron are the basic building blocks of all atomic nuclei, these experiments are a significant advance toward an understanding of the constitution of matter.

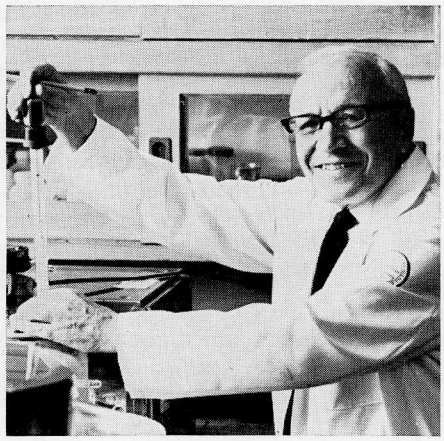
Announcement of the experiment was made at the 17th International Conference on High Energy Physics held at Imperial College, London, by Professor Rodney L. Cool of Rockefeller, Dr. Thaddeus F. Kycia of Brookhaven, and Dr. Winslow F. Baker of the Fermi Laboratory, representing the team of 16 scientists who collaborated on the project, among whom was Senior Research Associate Orrin D. Fackler. The research was supported by the Atomic Energy Commission.

Alfred E. Mirsky 1900-1974

Professor Alfred E. Mirsky, 73, a biochemist and physiologist whose pioneering work helped to lay the cornerstone of modern molecular biology, died on June 19 of a heart attack at his home at 350 Central Park West. He had been associated with this institution for 47 years.

President Seitz said of him: "Alfred Mirsky won our respect and friendship for his several roles at The Rockefeller University—as a biochemist and physiologist since 1927 and one of the pioneers in unlocking the secrets of the cell nucleus, as former chairman of the Faculty Committee on Educational Policies which restructured the old Rockefeller Institute, as a distinguished librarian, as founder and godfather of the Christmas lectures for high school students which have been held on the campus since 1959, and as a gracious and gentle scholar."

Dr. Mirsky's outstanding contributions were the isolation, in the 1940s, of the genetic material of mammalian cells, and his demonstration that every cell in the body has the same amount of DNA as every other cell except for the sperm and egg cells, which have half the amount and which, when combined, produce the normal complement of DNA. (The properties of DNA had been described earlier by Rockefeller scientists Oswald T. Avery, Colin MacLeod, and Maclyn McCarty.) The genetic material that Dr. Mirsky and his colleague, Arthur Pollister, isolated was called chromatin, a mixture of DNA, histones, and other proteins. In the 1930s, Dr. Mirsky worked with Rockefeller researcher Mortimer L. Anson and later, on a year's leave, he worked on the chemistry of proteins



with Nobel Laureate Linus Pauling at the California Institute of Technology. During this period, he paid a visit to China. Another major aspect of Dr. Mirsky's work was the separation of the hemoglobin pigment from its protein.

Alfred Mirsky was born in New York City on October 17, 1900. He was graduated from the Ethical Culture School and Harvard University, and received a Ph.D. in physiology from Cambridge University in 1925. He was awarded an honorary M.D. degree from the University of Gothenburg in 1954. In 1926, he married Reba Paeff, who died in 1966. He joined The Rockefeller Institute for Medical Research in 1927, and held the positions of associate from 1929 to 1940, associate member from 1940 to 1948, and member from 1948 until assuming the title of professor in 1954. Dr. Mirsky was an editor of *The Journal of General Physiology* and of *The Cell,* and was the author of numerous scientific papers. At the time of his death, he was working on a volume concerning the social implications of biology. He also pursued a lively interest in the history of art.

Dr. Mirsky is survived by his wife, Sonia Wohl Mirsky, associate librarian of the University, whom he married in 1967; by two children, Dr. Reba Mirsky Goodman, a member of the faculty of the College of Physicians and Surgeons of Columbia University, and Jonathan Mirsky, professor of Chinese studies at Dartmouth College; a sister, Jeannette, an author and anthropologist; and four grandchildren.

Gibson Appointed; New Duties for Viets

The responsibility for the administration of the University's grant applications, faculty appointments, and faculty records, previously handled by Pamela Lee, who has left the University, has been redistributed under the general supervision of Vice President Rodney W. Nichols. Eleanor Gibson, a recent graduate of Bryn Mawr College and New York University Graduate School of Business Administration, joined the University staff on June 3 as grants assistant. Phyllis Viets, who has worked closely with Mrs. Lee for the past two years, has assumed the duties of faculty records assistant.

This is the final issue of *news and notes* for the academic year. Publication will resume with the October issue. During the summer months, we will look forward to receiving news and other items of interest.

BRIEFS

Professor **Gerald M. Edelman** was awarded an honorary doctor of science degree from his alma mater, Ursinus College in Pennsylvania, on June 2. Dr. **Detlev W. Bronk** was the commencement speaker at the ceremonies and received an honorary doctor of humane letters degree. On June 7, Dr. Bronk also received an honorary doctor of science degree from Polytechnic Institute of New York. University Trustee **Marian Heiskell** also was awarded an honorary doctor of laws degree by Polytechnic.

On April 18, Dr. Edelman delivered the Edgar Fahs Smith Memorial Lecture at the University of Pennsylvania. He spoke on The Molecular Biology of the Immune Response.

Professor **Edward H. Ahrens, Jr.,** was guest speaker at a meeting of the American Pediatric Society, held in Washington, D.C. on May 1. His topic was Coronary Disease: Is Prophylaxis the Pediatricians' Problem?

President Seitz has been elected to membership in the Finnish Academy of Science and Letters.

THOMPKINS PROMOTED

Edward Thompkins, who has been a porter at the Rockefeller University Hospital since 1952, has been promoted to the post of head porter, as of July 1. He replaces Michael Brown who has retired.

PERSONALS

Born, June 10, to **Amilcar Negron,** assistant supervisor of janitorial services, and his wife, Mary, a son, Amilcar, their third child.

Born, June 11, to **Karen Gallin,** assistant for research in the laboratory of Professor Edward L. Tatum, and her husband, John, a businessman, a daughter, Katherine Elizabeth, their first child.

Susan Diehl, a junior secretary in The Rockefeller University Press Order Service, was married on June 22 to Timothy Cranston, a teacher.

DEATH

George Richard Collins, 57, supervisor of the University's Animal Facilities from 1957 to 1965, on May 8.

A Time for Farewells

Over the last few weeks, the University has been the scene of several leave-takings. Friends and fellow workers who raised farewell glasses to Michael Brown, on May 29, and to George Karda, on June 20, were saluting a total of nearly a century of service. Mr. Brown came to the Rockefeller University Hospital in 1928 as a porter and became head porter in 1947. Mr. Karda started as an office boy in 1924 and worked his way up to Power House clerk, general utility man, engineer-in-training, operating engineer, and chief engineer, in 1949.

With the retirement of Roger C. Elliot, the University also loses the able services of Pamela Lee, who is Mrs. Elliot, since they plan to leave the New York area. The Elliots were feted at a party on June 26. Mr. Elliot served in a number of administrative posts since 1956, as assistant business manager, assistant director of the budget and special services, assistant comptroller, director of the budget, and, from 1972, as director of administrative services. Mrs. Lee, as administrative assistant to the president, was responsible for the administration of grant applications, faculty appointments, and faculty records. She was with the University for 13 years.

George Karda, far right, receives well-wishes from Paul R. Penndorf and other University friends. Mrs. Karda is by his side.

New Horizons for the Class of 1974

Of the two women and thirteen men in the class of 1974, four will be remaining on campus, one will return to Africa under the University's aegis, two are headed for medical school, and the rest will scatter to other campuses across the country to pursue their varied and promising careers.

ARTHUR P. ARNOLD of Meadowbrook, Pennsylvania, will stay at the University as a National Institutes of Health Postdoctoral Fellow in Psychology.

CARL F. BEYER, JR. of Louisville, Kentucky, who was a Woodrow Wilson Fellow and National Science Foundation Predoctoral Fellow, will also remain on campus, as a postdoctoral fellow in cell biology and immunology.

J. DAVID CASTLE of New Haven, Connecticut, is pursuing research on the structure and function of exocrine secretory cells in the Section of Cell Biology of the Yale University School of Medicine.

MICHAEL W. DRAPER of Palos Verdes Peninsula, California, in preparation for a career in endocrinology, will complete a medical degree at Cornell University Medical College.

DANIEL M. FARRELL of Chicago, Illinois, who was a Woodrow Wilson Fellow, is an assistant professor in the Department of Philosophy at Ohio State University, where he has been on the faculty since 1971.

OWEN R. FLOODY of Wayne, New Jersey, who held a National Science Foundation predoctoral fellowship and won the Albert E. Angier Prize from Yale University, has been appointed assistant professor of psychology at Bucknell University.

MARY RITA GREENWOOD of Auburn, New York, a *summa cum laude* graduate of Vassar who has served as a postdoctoral fellow at the Institute of Human Nutrition at the Columbia University College of Physicians and Surgeons, will assume the post of research associate at Columbia University.

JOHN M. KINCAID of Portland, Oregon, will be serving as a postdoctoral fellow at the State University of New York at Stony Brook.

JUDY LIEBERMAN of Cranford, New Jersey, a *summa cum laude* graduate of Radcliffe and a National Science Foundation predoctoral fellow, will be a member of the Institute for Advanced Study in Princeton.

JONOTHAN LOGAN of New York City, who has been an assistant editor of *The Physical Review* and *Physical Review Letters,* both published by The American Physical Society, has been appointed a research associate at Rockefeller.

AARON RABIN of New York City, a *summa cum laude* graduate of Yeshiva University, had begun medical studies before entering Rockefeller and has been a National Institutes of Health Special Predoctoral Research Fellow. He will now resume his medical studies at the Albert Einstein College of Medicine.

ALLEN L. THUNBERG of Fargo, North Dakota, will remain at the University as

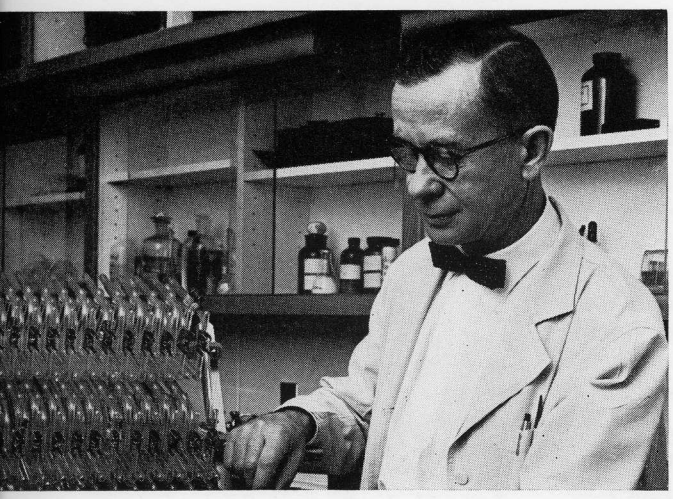
continued on page 8

NEW PLANTINGS ON PLAZA

Just in time for convocation, the Plaza area, between South Lab and the Tower, received the gift of green. The plantings include three species of yew (*Taxus baccata erecta, Taxus densiformis,* and *Taxus capitata*) interspersed with black pine (*Pinus thumbergi*), andromeda (*Pieris japonica*), and ivy (*Hedera*), and espaliered *Pyracantha lalandi* against the wall. The two tall trees in the center plantings are linden (*Tilia cordata greenspire*), and against the South Lab wall are hawthorns (*Crataegus phaenopyrum*). The design was the work of Calvert Coggeshall, who also designed the 17th floor of the Tower.

Pamela Lee and Roger C. Elliot

Left to right: Michael Brown and Vice President Maclyn McCarty.



Lyman C. Craig 1906-1974

Professor Lyman C. Craig, 68, a biochemist who gained worldwide recognition for his development of the counter-current distribution technique for the separation and identification of biologically significant compounds, died July 7 at his home in Glen Rock, New Jersey, after 41 years of distinguished service on this campus.

Dr. Craig's interest in the need for better analytical techniques began with structural studies of the alkaloids of ergot. In the course of those studies, he developed the method of counter-current distribution. One of the many uses of this procedure was in separating, for the first time, the two protein chains of hemoglobin. This result made possible a major structural study of hemoglobin. In laboratories all over the world, his method has been particularly useful in the isolation and study of substances such as the synthetic antimalarials, antibiotics, hormones, and proteins.

The American Chemical Society, in conferring on him its Fisher Award in Analytical Chemistry in 1965, said: "Many of the important advances made in biochemistry in the past several years would not have been possible without Dr. Craig's technique." When he received the 1963 Albert Lasker Basic Medical Research Award, his technique was cited as "crucial in the establishment of the structure of insulin, and in the isolation and study of hormones and other compounds and structures that are synthesized for therapeutic purposes."

The American Pharmaceutical Association honored him with the 1971 Kolthoff Gold Medal and the American Microchemical Society with the 1972 Benedetti-Pichler Award.

Lyman Craig was born in Palmyra, Iowa in 1906 and received the B.S. degree in 1928 and Ph.D. degree in 1931 from Iowa State University. He received an honorary D.Sc. degree from Northwestern University in 1973. In 1931 he won a National Research Council Fellowship which permitted him to study for two years at The Johns Hopkins University. Shortly before his death, he was elected to membership in The Johns Hopkins Society of Scholars. He came to Rockefeller in 1933 as an assistant, became an associate in 1937 and professor in 1949.

Dr. Craig is survived by his wife, the former Rachel Warner Parker; two daughters, Mrs. Anna Craig Miller and Bess Craig; a son, David; a brother, Charles; and six grandchildren.

PROMOTIONS

Promotions effective July 1:

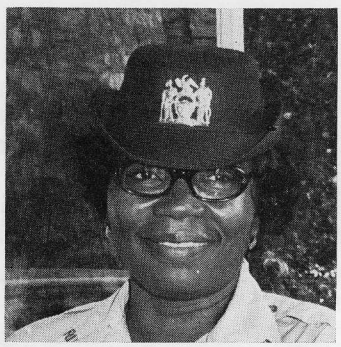
William C. Agosta, Organic Chemistry, to professor.

Paul H. Schreibman, Cholesterol Metabolism, to associate professor and physician.

David V. Bowen, Physical Chemistry, **Akira Inoue,** Cell Biology, **Susan G. Langreth,** Parasitology, **George C. K. Liu,** Cholesterol Metabolism, **David Micco,** Physiological Psychology (as of June 1), **Jose Sy,** Biosynthesis, and **Peter Wernet,** Immunology, to assistant professor. **Richard F. Levine,** to assistant professor and associate physician.

Associate Professors **Donald W. Pfaff,** Physiological Psychology, and **John B. Zabriskie,** Bacteriology and Immunology, granted tenure.

FIRST WOMAN GUARD



When Frank Courtney applied for a position as a University guard last winter, his wife, Dorothy, accompanied him to the interview with Warren H. Munroe, manager of safety and security. In the course of conversation, Mrs. Courtney pointedly revealed that she, too, was a qualified police officer, having served for 15 years on the police force in her native Jamaica. Captain Robert Davis, who was present at the interview, whipped out an application. When a vacancy came up, in came Mrs. Courtney—on June 10—the University's first woman guard.

Homage to Lipmann at 75

On the occasion of the 75th birthday of Professor Fritz Lipmann, a special symposium in his honor was held at the Max-Planck-Institut für Molekulare Genetik in West Berlin, on July 8 and 9. The meeting launched the first Lipmann Lecture, which is expected to become an annual event sponsored by the West German Society of Biological Chemists. It was presented by Feodor Lynen, director of the Max-Planck-Institut für Biochemie in Munich. Some 60 of Dr. Lipmann's former colleagues and collaborators from all over the world reported on their current research, and 20 invited friends also attended. Professors Leonard B. Spector and Jose Sy, and Dr. Lipmann's secretary, Christian Gillespie, accompanied Dr. and Mrs. Lipmann to Berlin. The meetings were sponsored by the Schering and Boehringer-Mannheim Companies and by the Gesellschaft für Biologische Chemie and the Max-Planck-Gesellschaft. Dr. Lipmann was born in Koenigsberg on June 12, 1899.

NEW HORIZONS *continued from page 7*

a postdoctoral fellow before going on to further postdoctoral work at The Johns Hopkins University, in 1975.

JOHN B. TUTTLE of Pelham, New York, a member of the Special Interest Group for Biomedical Computing, has been appointed a research associate at the Center for Visual Science of the University of Rochester.

JAY C. UNKELESS, formerly of California, whose family now resides in London, England, will be working at the Cancer Research Center of the Massachusetts Institute of Technology on a postdoctoral fellowship.

PETER WASER of Pasadena, California, has been appointed a postdoctoral fellow at Rockefeller and will return to East Africa for continued study of primate ecology and social structure.

APPOINTMENTS

The appointment of **James E. Darnell, Jr.,** Molecular Cell Biology, as professor was announced several months ago. It will take effect as of July 1. Other appointments are:

Balz Gisin, Biochemistry, and **William S. Hall,** Comparative Human Cognition, associate professors; and **Frank R. Landsberger,** Virology, **Warren Jelinek,** Molecular Cell Biology, **Thomas Spencer,** Foundations of Quantum Field Theory, and **Edward Ziff,** Molecular Cell Biology, assistant professors.

news and notes is published monthly from October to July. This is Volume 5, Number 10. Contributions are welcome and may be sent to *news and notes,* Box 194 or phone ext. 1166. Photographs: pages 1, 2, 3, 7, and 8 by Henrik Boudakian, except Waser photograph on page 3 by Mary Sue Waser; page 5 by Missak Sarafian; page 6 by Ingbet.