

11-1974

NEWS AND NOTES 1974, VOL.6, NO.2

The Rockefeller University

Follow this and additional works at: http://digitalcommons.rockefeller.edu/news_and_notes_1974

Recommended Citation

The Rockefeller University, "NEWS AND NOTES 1974, VOL.6, NO.2" (1974). *News and Notes 1974*. Book 9.
http://digitalcommons.rockefeller.edu/news_and_notes_1974/9

This Book is brought to you for free and open access by the The Rockefeller University News and Notes at Digital Commons @ RU. It has been accepted for inclusion in News and Notes 1974 by an authorized administrator of Digital Commons @ RU. For more information, please contact mcsweej@mail.rockefeller.edu.

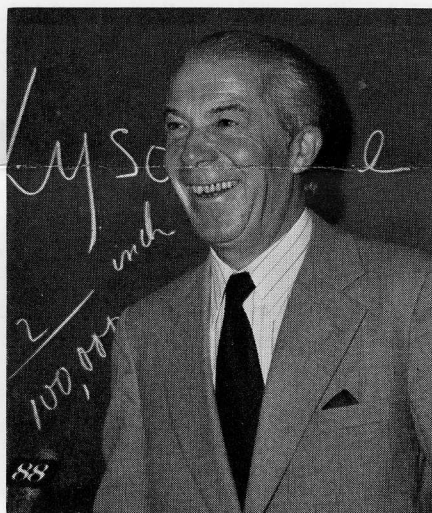
A Nobel Prize for Claude, de Duve, and Palade

Seminal Work Done at Rockefeller

Before Albert Claude began his pioneering work in cell fractionation and electron microscopy, the living cell—like Rapunzel in her tower—remained waiting for its deepest secrets to be discovered.

Claude, a native of Belgium, came to The Rockefeller Institute for Medical Research in 1929, having just completed a medical degree at the University of Liège. He worked on sub-cellular components and on the Rous sarcoma virus which by the late 1930s, he had isolated and purified and partially characterized as a “ribose nucleoprotein.” He also had discovered that normal cells contain similar particles, which he called microsomes. They contain about half of the ribonucleic acid of the cell.

By the early 1940s, his continuing efforts to identify the elements he had isolated from cells was leading him beyond the scope of ordinary light microscopes. For a decade, scientists had realized the potential of electron microscopy for biological research—with its resolving power so much greater than that of the best light mi-



CHRISTIAN DE DUVE

croscopes—and they had been trying to solve some of the technical problems inhibiting its full use. One of those problems was how to obtain tissue specimens thin enough for the limited penetration power of electrons. Getting access to the electron microscope at the Institute's Princeton laboratories, Claude turned his skill and ingenuity to the problem, collaborating with Keith R. Porter, an Institute col-

continued on page 3

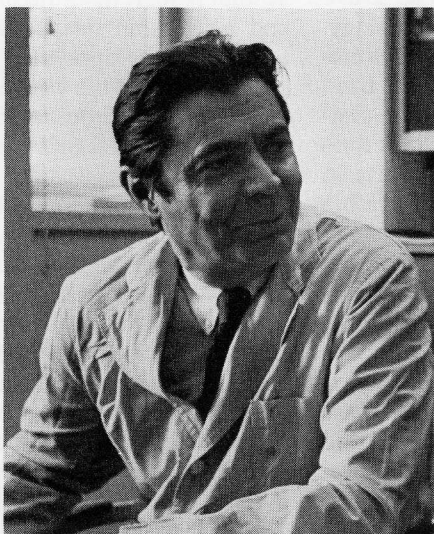
Cited for Pioneering Studies of the Cell

“Twelve years ago, when I was given the opportunity to join this institution, I felt I was coming to my spiritual home.” Thus, on the stage of Caspary Auditorium on October 12, flanked by microphones and television cameras, Professor Christian de Duve accepted the congratulations of his friends and colleagues at Rockefeller University, after President Seitz read the cablegram from Stockholm which said:

“Karolinska Institute has decided to award the Nobel Prize in Physiology or Medicine for 1974 jointly to yourself and to Albert Claude and George Palade for your discoveries concerning the structural and functional organization of the cell.”

Dr. de Duve's award brings the number of Rockefeller Nobelists to 13, although, as he was quick to point out, the count should be put at 15, since the seminal work done by Dr. Claude, emeritus director of the Institut Jules Bordet in Brussels, and now invited professor at the University of Louvain, and by Dr. Palade, now at the Yale University School of Medicine, was achieved during their years on this campus. “Without exaggeration,” said Dr. de Duve, “The Rockefeller Institute for Medical Research was the cradle of modern cell biology.” He then briefly described Dr. Claude's 20 years here, from 1929 to 1949, during which he pioneered the use of electron microscopy and centrifugal fractionation in the study of cells, and of George E. Palade who, from 1946 to 1973, developed the use of the electron microscope to a “very fine art” and made the discovery of ribosomes, the protein synthesizers of cells. Dr. de Duve's own unique achievement was the discovery, 20 years ago, of lysosomes, digestive organelles which he described as the equivalent of the cell's “stomach.”

continued on page 2



GEORGE E. PALADE



ALBERT CLAUDE

Chance Observation Was Clue to Lysosome

Lysosomes are tiny bags containing powerful digestive enzymes capable of breaking down most of the constituents of living matter within animal cells. Though, in size, lysosomes frequently are within the lower limit of visibility in the light microscope and easily within range of the electron microscope, they were first discovered by biochemists rather than optical methods. Christian de Duve, their discoverer, suggests that they undoubtedly had been seen many times before, but their nature and function went unrecognized until they were chemically characterized.

The first clue came from a chance observation—"we accidentally stumbled on lysosomes"—in Dr. de Duve's laboratory at the Catholic University of Louvain in 1949. He and his colleagues had just begun to use the technique of centrifugal fractionation, newly developed by Albert Claude and others. (At about this time, Dr. de Duve recalls, Dr. Claude returned to Belgium and "I was able to get his advice.") In centrifugal fractionation, cells are disrupted in a homogenizer and then spun in a test tube inside a centrifuge at successively higher speeds to separate organelles of varying size and density. When isolated, the various types of organelles still maintain many of their functional properties and can be explored by biochemical methods.

To simplify drastically, Dr. de Duve and his colleagues would analyze the centrifuged contents of the test tube for certain enzymes and then try to determine the nature of the organelle that produced them. In one experiment, they noticed that a certain enzyme included in the experimental protocol largely for control purposes could not be found in the test tube after centrifugation. Resisting "the temptation to discard the first series of results as being due to some technical error," Dr. de Duve found, after further experiments, that in living cells the enzyme is largely or entirely confined within little cellular "stomachs." Several years of study revealed that this hitherto unsuspected group of organelles contained more than a dozen different enzymes capable of acting on all major constituents of living matter, including proteins, nucleic acids, and complex sugars. These enzymes could have but one purpose: a lytic or digestive one. Hence, the organelles containing them were named "lysosomes" (digestive bodies).

In 1955, the electron microscopist and the biochemist joined forces to confirm visually the identity of the ly-

sosome. Working with Alex B. Novikoff of the Albert Einstein College of Medicine in New York, "we obtained our first electron micrographs of cell fractions containing partially purified lysosomes."

JOINT STUDY PROGRAM AWARDED N.I.H. GRANT

The Rockefeller University-Cornell Medical College joint study program in the biomedical sciences, a six-year course leading to the M.D. degree from Cornell and Ph.D. from Rockefeller, has received a five-year grant from the Biomedical Science Program of the National Institutes of Health. The N.I.H. funds will provide support for three of the five students selected to participate each year.

The joint program, which welcomed its first five candidates in 1972, now numbers 15 students. The original five have completed their first two years of medical study at Cornell and will begin the research phase of their training at Rockefeller. They will continue to attend conferences and clinical rounds at Cornell. Codirectors of the program are Professor and Senior Physician Zanol A. Cohn of the University's laboratory of cellular physiology and immunology, and Professor Alexander G. Bearn, chairman of the Department of Medicine at Cornell.

Gotschlich, Colleague Receive Squibb Award

Emil C. Gotschlich, physician and associate professor in the laboratory of bacteriology and immunology, received the Squibb Award of the Infectious Disease Society of America at the Society's annual meeting, held in San Francisco on September 9. The award is presented each year to an individual (or individuals) under the age of 45 who has made an outstanding contribution in the field of infectious diseases. Dr. Gotschlich was corecipient with Dr. Malcolm S. Artenstein, director of the bacteriology department of the Walter Reed Army Institute of Research. During his period of military service, from 1966 to 1968, Dr. Gotschlich worked with Dr. Artenstein at Walter Reed on the development of a successful vaccine against the form of cerebrospinal meningitis designated group C, which had been a persistent problem at military installations (see *news and notes*, January 1974). More recently, he has collaborated with the World Health Organization in the testing and evaluation of a related vaccine for group A meningitis, which produces periodic epidemics in Africa and which is currently breaking out in Brazil and Finland. Field trials in Africa over the past three years have yielded successful results. Similar trials have been launched in the other problem areas.

CITED FOR PIONEERING STUDIES *continued from page 1*

In 1971, volume 50 of *The Journal of Cell Biology* was dedicated to Albert Claude, "founder of modern cell biology." The issue contained two articles about Dr. Claude's contributions to cell research, one by Dr. Palade and the other by Dr. de Duve.

After looking back, Dr. de Duve talked about the future of cell biology. "A large number of fundamental discoveries in basic biology have been made. My co-workers and I, in Belgium and in New York, feel it is time to apply our knowledge to efforts in medicine and therapeutics. We are beginning to have results which may have applications in such areas as hereditary diseases, aging, arteriosclerosis, immunology, and cancer therapy. Most diseases that have eluded medical research are probably cellular diseases: we are sick because our cells are sick. We need to look into the cell and use our new knowledge to design new drugs. New knowledge is intellectually gratifying but now we must give the benefits to mankind."

A Belgian national, although born in England in 1917, Dr. de Duve received the degree of doctor of medicine, surgery, and obstetrics in 1941 and the master of science in chemistry in 1946 from the University of Louvain, Belgium. After a period of research at the Nobel Institute in Stockholm and at Washington University in St. Louis, he was appointed professor of biochemistry at the University of Louvain Medical School in 1951. In 1962 he was appointed professor at Rockefeller, while maintaining his appointment at Louvain, where he still heads a large laboratory. In May of this year, he was named Andrew W. Mellon Professor, a chair established under a grant from the Andrew W. Mellon Foundation in support of Rockefeller University's programs in cellular biology and experimental pathology.

Doctors Claude, de Duve, and Palade will share prize money of approximately \$124,000 after their Nobel awards are formally presented to them in Stockholm on December 10.

league, and Ernest F. Fullam of the Interchemical Corporation, and working with the Institute's instrument shop. Together they achieved a specimen sufficiently thin to make possible the first electron micrograph of a cell, which was published in 1945 in *The Journal of Experimental Medicine*. The revelations of structure, although still only partial, represented an immense step forward. Institute Director Herbert Gasser, who had been wary of incurring the expense, now hastened to supply Claude and his co-workers with an electron microscope of their own in New York. By that time, George E. Palade had joined the group which continued its efforts to refine the mechanics of fixing specimens and cutting thin sections, developing methods now used in labs all over the world. These led, among other things, to the discovery by Porter and Palade of the endoplasmic reticulum, a network of extremely fine canals or chains of vesicles in the extranuclear substance of the cells and to the first demonstration of viral particles in Rous sarcoma cells.

In addition to his achievements in electron microscopy, Albert Claude developed new and critically important techniques for the quantitative mass isolation of subcellular components by means of centrifugal fractionation. As explained by George Palade, writing in *The Journal of Cell Biology*, "Subcellular components, already known from light microscopy or newly discovered by electron microscopy, could be isolated in mass from various tissues. Isolation was the first step in determining their biochemical composition and biological activities, which in turn was a prerequisite for understanding their function. Integrated structural-functional studies of various cell structures became possible, and with such studies modern cell biology started.

"Since the middle 1940s techniques in this field have been continuously improved and refined, the mass of accumulated findings on the structure, biochemistry, and function of subcellular components has increased at an amazing rate, and our understanding of many aspects of cellular organization has progressed impressively. But spectacular as they may appear to us today, all these achievements are ultimately based on a few critical papers Claude alone or with his collaborators published in the middle 1940s. Seldom has a field owed so much to a single man."

Albert Claude left The Rockefeller in 1949 to return to Belgium. In

Krause to Head New Animal Research Center

Professor Richard M. Krause, senior physician and head of the laboratory of immunology and immunochemistry, has been appointed director of the new animal research center, currently rising on York Avenue between 63rd and 64th Streets. The six-story building, still mostly a skeleton but gaining more flesh and muscle every day, is expected to be completed by the spring.

"The center has been designed with the flexibility to meet the particular needs of our investigators," reports Dr. Krause. "Among its features will be quarantine facilities, where incoming animals can be kept for periods sufficient to insure that infections do not spread; and special areas for radioisotope work and for experiments on viral and bacterial infections, where research can be performed and the animals maintained with no possibility of hazards to workers. In addition to general animal-holding space, each floor will be equipped with a specialized lab in which investigators can conduct intensive short-term observations on single animals or small groups of animals." Besides its innovative design, the center will provide badly needed additional space for new projects which could not be undertaken previously.

Dr. Krause, who has had extensive experience with the use of animals in

1971, he was awarded an honorary doctor of science degree by Rockefeller University.

* * *

One who contributed most significantly to the "spectacular" mass of findings on the structure, biochemistry, and function of subcellular components is George E. Palade, who came to The Rockefeller in 1946, a few years after earning a medical degree at the University of Bucharest in his native Rumania. His early work was in electron microscopy and in cell fractionation, which led him, in the middle 1950s to join with Professor Philip Siekevitz on a long series of integrated morphological and biochemical studies, using electron microscopy to check the results of fractionation procedures.

Dr. Palade is best known for his work on the structure of mitochondria and for the discovery of ribosomes—ribonucleoprotein particles in the cytoplasm—which are the sites of protein synthesis. Among other achievements, Dr. Palade and his group analyzed, by electron microscopy, cell



Going up: new Animal Research Center (in background), the University's new apartment house.

his own research, served as chairman of the faculty-student committee which helped to develop the plans for the new center in collaboration with Professor Herbert L. Morton, veterinarian, and H. Osborn Bagg, supervisor of the present animal facility, both of whom will continue in those capacities in the new center. An expanded committee will continue to participate and consult with Dr. Krause and his staff.

fractionation, and autoradiography, the secretory cycle of the pancreatic exocrine cell. The results accounted for the role of nearly every known cellular component in the secretory process. Subsequently this cell became one of the best understood cells in terms of structure and function and the knowledge gained by Dr. Palade and his colleagues frequently has been used as a model in interpreting findings made on other cell types.

In 1970, Doctors Claude, Palade, and Porter shared the \$25,000 Louisa Gross Horwitz Prize, presented by Columbia University. The citation credited them, among other things, with providing "the pigment, the canvas, and the style for a school which has been most influential in the recent biological renaissance."

news and notes is published monthly from October through July. This is Volume 6, Number 2. Contributions are welcome and may be sent to *news and notes*, Box 194 or phone ext. 1166. Photographs: page 1, lower left Albert Fenn, lower right and upper Henrik Boudakian; page 3 Missak Sarafian. © 1974 The Rockefeller University Press, New York 10021. Printed in the United States of America.

Puttoowwee, Anyone?

On Saturday, October 5, with the R. U. flag hoisted to the fore, a *Tricycle Grand Prix de York Avenue* Procession led by George Barany, Larry Gerace, Pete Lefebvre, Eileen Mahoney, and Richard Piccioni, kicked off the Third Annual Rockefeller University Olympics—that day, once a year, when normally sober students of The Rockefeller doff lab coats, don the colors, and pit brain and brawn in such events as the Cholesterol Classic, the Alcoholics' Race to Oblivion, and the Marshmallow Puttoowwee (sic).

Amid the aroma of beer, burgers, and franks, the old volleyball court turned parking lot—affectionately renamed "Brink Bowl" for the occasion—became once more a scene of sporting splendor as Norman Kagan puttoowweed his marshmallow 34 feet, outdistancing his closest rival by 13 feet to take the event for an unprece-

dent third straight year. After a sticky start, the 60-foot winning toss in the Cholesterol Classic, better known by country folk as an egg-catching contest, was made by teammates Owen Griffith and John Sogn. In another major event, relay teams of four alternated tricycling and swigging strawberry wine. (The winners prefer to remain anonymous). This was followed by a special race for the children who had contributed their tricycles, with pretzels substituted for the wine.

A highlight of the afternoon was the Mister Rockefeller Pageant, which was won by Rocky Tuan, chosen for his beauty, talent, and poise in answering questions and not, asserts head "female chauvinist" Eileen Mahoney, for the punning value of his name.

APPOINTMENTS

Effective July 1:

John E. Franklin, Jr., Metabolism-Pharmacology, to assistant professor.

Effective September 1:

Orrin D. Fackler, Experimental Physics, to assistant professor.

Effective October 1:

Donald J. McNamara, Cholesterol Metabolism, to assistant professor.

Effective October 15:

Urs Rutishauser, Biochemistry, to assistant professor.

Effective November 1:

Dalton Wang, Biochemistry, to assistant professor.

PROMOTIONS

Effective July 1:

Giorgio Vadali, Cell Biology, to associate professor.

Paul J. Edelson, Cellular Physiology and Immunology, **Ann Ho**, Biology of Addictive Diseases, **Adolfo Ruiz-Carrillo**, Cell Biology, and **George A. Scheele**, Cell Biology, to assistant professor.

Effective September 1:

Donald E. Kroodsmas, Animal Behavior, and **Sung G. Lee**, Biosynthesis, to assistant professor.

Effective October 1:

Robert S. Feinberg, Biochemistry, and **Robert T. Reese**, Immunology and Hypersensitivity, to assistant professor.

PERSONALS

Born, June 19, to **Frederick A. Dodge**, adjunct associate professor, Biophysics, and his wife, Catherine, a son, Michael Frederick, their second child.

Born, August 13, to Professor **William E. Bowers**, Biochemical Cytology, and his wife, Barbara, a daughter, Kendra Michelle, their second child.

Born, August 18, to Dr. **Jean-Dominique Vassalli**, a graduate fellow in the chemical biology laboratory of Professor Edward Reich, and his wife, Marjoline, a son Eric Sebastian, their first child.

Born, August 20, to Professor **Ta-hsiu Liao**, Biochemistry, and his wife, Tsui-hsing, a daughter, Cinderella, their first child.

Katherine Urbina, a secretary in the laboratory of Professor Abraham Pais, was married on August 31 to Carlos Cabrerias, an electrician.

DEATHS

September 16, **I. Arthur Mirsky**, 67, visiting professor and physician with the University's laboratory of human behavior and metabolism since 1966. He was professor of medicine and psychiatry at the University of California at Los Angeles and distinguished physician of the Veterans Administration.

October 20, **Cornelia Van Rensselaer Robb Goebel**, 70, wife of Professor Walther F. Goebel. Mrs. Goebel served on the boards of the Virginia Day Nursery in New York and the Alliance Française in Greenwich, Connecticut.

BRIEFS

Professors **Dennis M. Dwyer** and **Araxie Kilejian**, Parasitology, and **Donald G. Lindmark**, Biochemical Cytology, and Postdoctoral Fellow **Fred Brohn**, Parasitology, each presented papers at the annual meeting of the Society of Protozoologists, held at Wesleyan University, August 13-17.

Professor **E. G. D. Cohen**, Theoretical Physics, served as a lecturer and was a member of the organizing committee for the Third International Summer School of Fundamental Problems in Statistical Mechanics, sponsored by the Netherlands Universities Foundation for International Cooperation in collaboration with Rockefeller University. It was held in Wageningen, The Netherlands, from July 29 to August 15. Trustee **H. B. G. Casimir** presented a seminar and **President Seitz** also visited the school. Both spoke at the closing dinner. Seventy students from 20 countries attended, including Graduate Fellow **David Lieberworth**.

Professor **William Trager**, Parasitology, gave the presidential address at the 49th Annual Meeting of the American Society of Parasitologists, held in Kansas City, Missouri, August 5-9. Professor **Miklós Müller**, Biochemical Cytology, also spoke at the meeting. Doctors Trager and Müller each chaired sessions and presented papers at the Third International Congress on Parasitology, held in Munich, August 25-31, at which papers were also given by Professor **Dennis M. Dwyer**, Research Associate **Kwang Poo Chang**, and Graduate Fellow **Rocky Sung-chi Tuan**. Dr. Chang was invited to speak at a Symposium on Symbiosis, sponsored by the British Society for Experimental Biology, at the University of Bristol, England, September 2-6.

Professor **Paul A. Weiss**, Developmental Biology, was invited to Heidelberg, Germany last June to be the first guest of honor of the new German Cancer Research Center. Dr. Weiss presented the Lettré Memorial Lecture at the center. In September he gave papers at the European Forum at the Austrian College and at the International Symposium on Physiology and Pathology of Dendrites, in Munich.