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The Rockefeller University

News and Notes

The Rockefeller University

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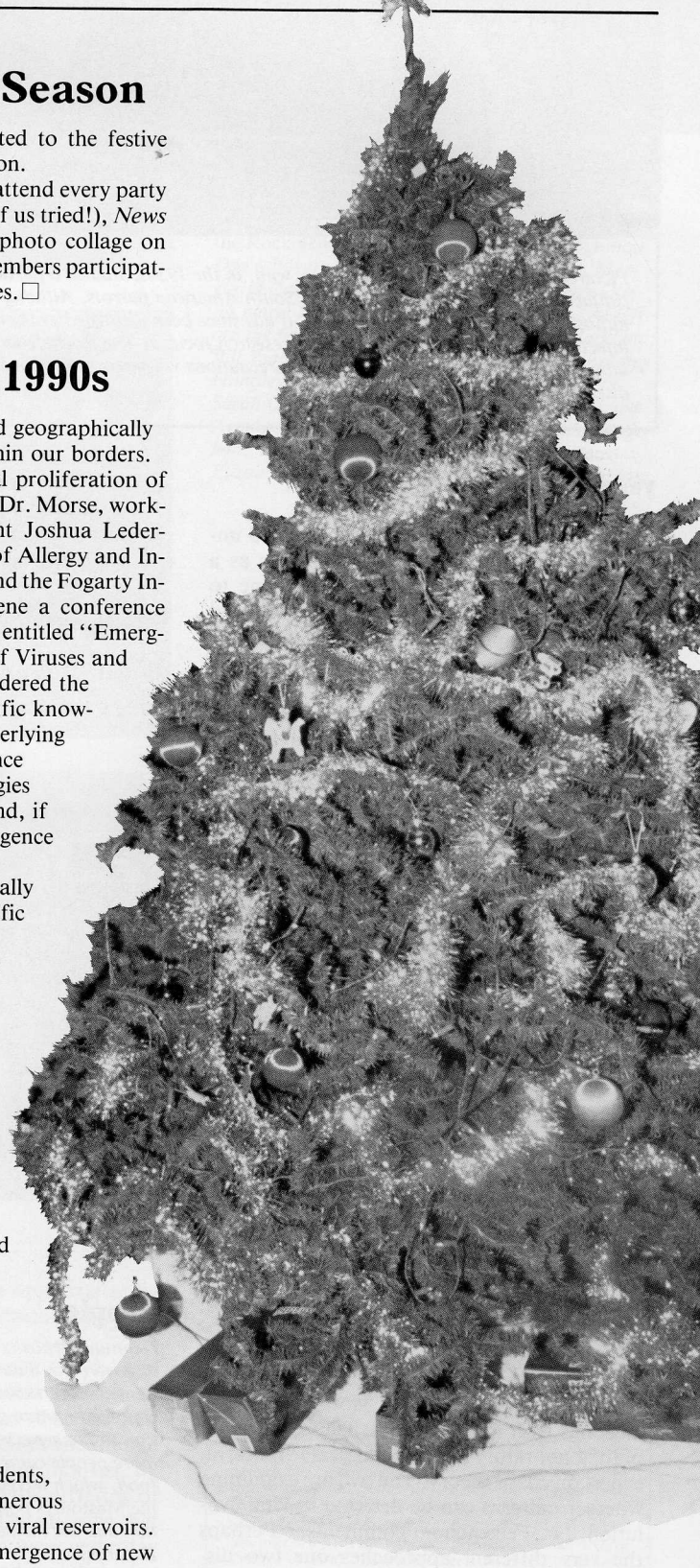
Rockefeller Rejoices during Holiday Season

"'Tis the season to be jolly . . ." And jolly it was all over campus during the 1989 holiday season, closing out the decade in style and good cheer. Christmas carols in the hallways sung by the junior carolers of the Children's School, holly hung in office areas, and the traditional get-togethers organized by many laboratories and support services all contributed to the festive sights and sounds of the season.

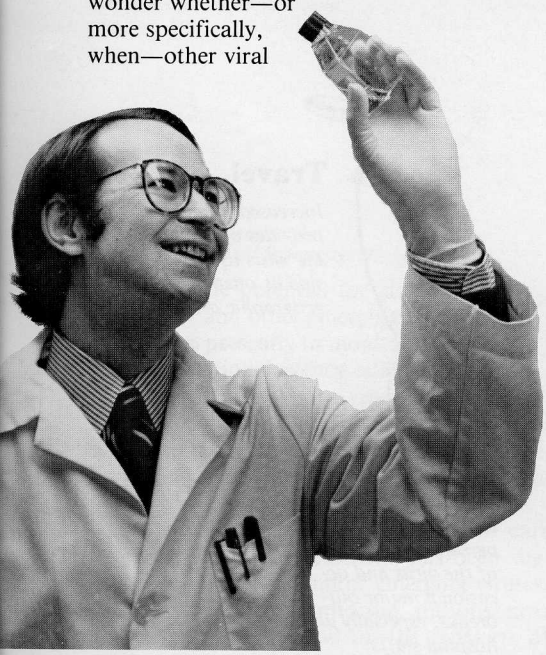
Since it was impossible to attend every party on campus (although many of us tried!), *News and Notes* has assembled a photo collage on pages 4 and 5 of university members participating in the December festivities. □



Emerging Viruses: Challenge for the 1990s

Following World War II, surgeons general of the U.S. Public Health Service were often quoted as declaring that infectious diseases were no longer a serious problem and that American science should turn its attention toward chronic ailments, such as cancer and heart disease. Perhaps there was reason for such optimism. A number of viruses, most notably smallpox, had been brought under control during the postwar years, lulling the public into the misbelief that medical science had all but conquered viral disease.

However, starting in 1981, viruses again forced their way onto the world stage when scientists announced that a deadly viral scourge, AIDS, had appeared and was rapidly spreading among segments of the global population. This renewed awareness of viral diseases prompted virologists like Rockefeller University Assistant Professor Stephen Morse to wonder whether—or more specifically, when—other viral diseases, as yet culturally and geographically restricted, would appear within our borders.



Assistant Professor Stephen Morse

Concern over the potential proliferation of these "emerging viruses" led Dr. Morse, working with University President Joshua Lederberg, the National Institute of Allergy and Infectious Diseases (NIAID), and the Fogarty International Center, to convene a conference last year in Washington, DC, entitled "Emerging Viruses: The Evolution of Viruses and Viral Disease." Widely considered the first attempt to survey scientific knowledge of the mechanisms underlying viral emergence, the conference focused on developing strategies for anticipating, detecting, and, if possible, preventing the emergence of viral disease.

"Virologists have traditionally concentrated on solving specific problems regarding viruses," Dr. Morse points out. "With this conference we gained a wider, historical perspective and a glimpse of the viral threats that may lie ahead." The importance of studying emerging viruses was summed up by Dr. Lederberg in his keynote address to the conference: "In the natural evolutionary competition between ourselves and the viruses, there is no guarantee that we will find ourselves the survivor."

A virus "emerges" when it is introduced into a human population, usually from an animal host, or reservoir, which carries the virus with little or no harm to itself. Rodents, for example, are the most numerous mammals on earth and major viral reservoirs. Stephen Morse notes, "The emergence of new

(see Viruses, page 2)

Pictured above is Dr. George P. Berry who, in the 1930s, studied a particularly virulent disease called psittacosis, or parrot fever, carried by South American parrots. Although psittacosis, now called ornithosis, was then believed to be viral, it has since been identified as bacterial in origin. The study of infectious diseases has been a longtime research focus at The Rockefeller University. Then, as now, university researchers took appropriate precautions when working with animal reservoirs of infectious disease.

Viruses, *continued from page 1.*

viruses has always seemed mysterious and unpredictable. Only very recently—largely as a result of this conference—have we come to realize that this isn't really true. Most 'new' viruses are simply existing viruses of animal species that have been given new opportunities to spread."

A virus is really little more than a package of genes wrapped in a protein coat. Whereas most organisms, from bacteria to humans, use their own cellular machinery to grow and reproduce, viruses commandeer and reprogram the cell machinery of other organisms, making them their hosts. When this happens, the host cells cease their normal functions and start manufacturing copies of the virus instead.

The conference raised questions about the intricacies of a virus's strategy for survival. Dr. Lederberg commented that "in the long run, even the death of a single individual (host) is relatively disadvantageous to the virus, compared to a sustained infection that leaves a carrier free to spread the virus to as many contacts as possible." He notes that, from the perspective of the virus, the ideal would be a "nearly symptomless infection in which the host is oblivious of providing shelter and nourishment for the indefinite propagation of the virus's genes."

Despite the wealth of knowledge accumulated on viral diseases by scientists, it is still difficult to anticipate where and when viral outbreaks may occur. To explore any tenets that may underlie what appears to be a random process of viral emergence, Dr. Morse has regular meetings with Professor Mitchell Feigenbaum of the Laboratory of Mathematical Physics, an expert on chaos theory. The two are examining whether patterns can be detected in viral evolution. Dr. Feigenbaum comments, "Perhaps the very different approaches our two disciplines take to the subject will create some kind of cross-fertilization. But first we have to quantify the various components that restrict or encourage viral emergence."

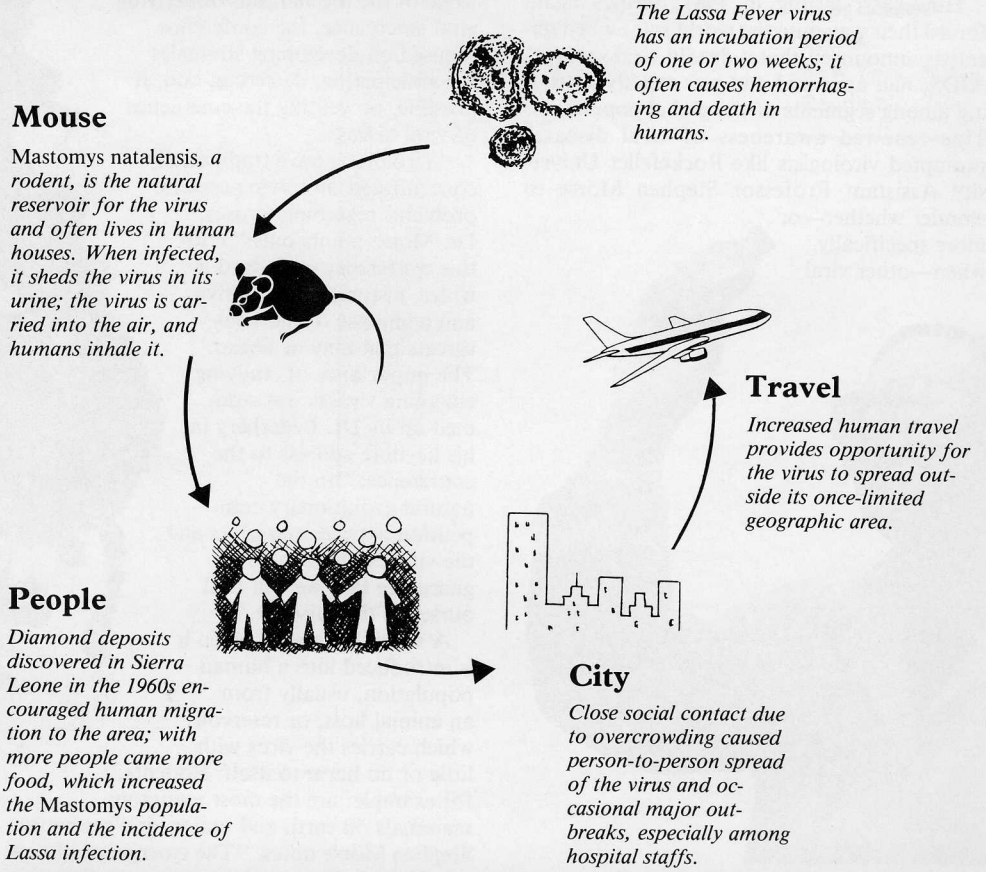
Among the many factors that must be included in such an analysis are the availability of susceptible hosts, the ease in which a virus spreads, the length of the viral infection period, and the virulence of the virus. In addition, Dr. Morse notes that "environmental and social changes often promote the transfer of viruses to new hosts. In other words, human activities are often the main cause of viral emergence."

Agricultural practices can cause shifts in the animal and plant species of an area, leading to new opportunities for viruses. For example, Argentine Hemorrhagic Fever, caused by the Junin virus, has expanded its range in the Buenos Aires and Córdoba provinces of Argentina. Earlier in this century, farmers in these areas turned from mixed crops to a concentration on maize production. Herbicides used since World War II to increase maize yields killed off much of the flora of the area and, consequently, reduced the diversity of rodent species, leading to domination of the area by the mouse *Calomys musculinus*. This rodent is the reservoir for Junin virus, and with its proliferation, the virus has spread: between 300 and 600 new cases of the disease are reported annually.

Social conditions and travel can also encourage the spread of viral diseases. Oropouche, a disease native to Brazil and Trinidad, has recently been reported in Panama. From there it could eventually enter the U.S. when American soldiers now in Panama return home. An historical precedent for this is Hantaan, a deadly virus once limited to the Far East, which came to Western attention when American soldiers contracted it during the Korean War.

(continued on next page)

Lassa Fever, A Case Study: Sierra Leone, West Africa, 1969

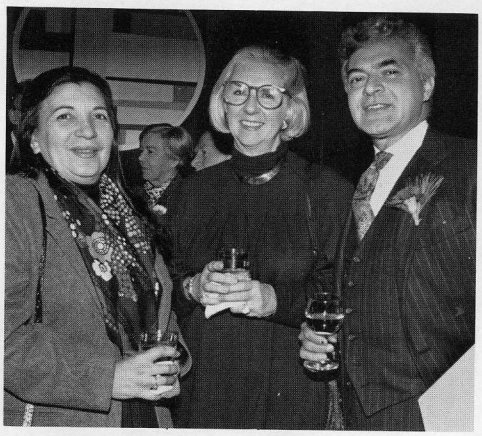


Employee Recognition Day Honors Many Years of Service

Thirty-three members of the campus community were honored at the fourth Employee Service Recognition Award Program on December 18. The annual event celebrates those employees who have achieved ten and twenty years of service.

At the heart of the festivity, which included a reception in Abby Aldrich Lounge, was a ceremony in Caspary Auditorium organized by Personnel Director John J. O'Donnell and the program committee. Gifts symbolizing the university's gratitude for longtime loyal service were presented to each of the celebrants, who together have provided more than 500 years of service.

Joshua Lederberg, who presided over the event, expressed the university's appreciation to these employees for providing indispensable support, which enables the university to fulfill its mission. This year, the last in his tenure as university president, Dr. Lederberg was surprised by a special presentation acknowledging his twelve years of service: a leatherbound edition of *A History of the Rockefeller Institute*, written by George W. Corner. Dr. Lederberg will become a university professor when he steps down from the presidency in July.□



On behalf of the university, Assistant Director of Personnel Eileen T. Holleran presents Dr. Lederberg with a leather-bound edition of A History of the Rockefeller Institute *at Employee Recognition Day (above). Above left, from left to right, Margarita Campbell, Regina Titus, and Zachary Contes pause for a photo during the reception. At left are the ten-year awardees (l to r): Elaine Markland, Bill Tsang, Carmen Schmidt, Arelis Sable, Bradley Hundley, Josefina Poniente, Joshua Lederberg, Sarah O'Hagan, Luis Matos, Adelaide Acquaviva, Armand Gazes, Jacqueline Chiappetta, and Madeleine Tierney. Not pictured are Alicias Armstrong, Elizabeth Horak, Ellen Riordan, and Ellen Ziman.*

At right are the twenty-year awardees (l to r): Virginia L. Rosario, Rose E. Lawrence, H. Osborn Bagg, Ann Quatela, Joshua Lederberg, Veronica Barrow, Zachary J. Contes, Marie LeDoux, Frank Santos, Ann Hruda, Nuton Stewart, Helen Robinson, and Maria Roldan. Not pictured are Patsie Moore, Neftali Rivera, Oswald Robinson, James Stiasny, and Venecia Urena.

Viruses, *continued from page 2.*

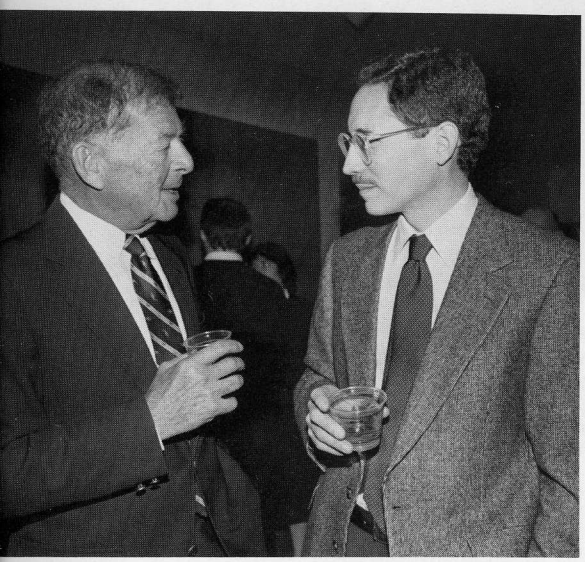
Despite the potential for global pandemics from these and other emerging viruses, little is being done presently to monitor them. "There is no international agency established to investigate outbreaks of new viruses," comments Dr. Dennis Stark, Director of the university's Laboratory Animal Research Center. "The reporting agencies are out there in the field, but we have little international coordination."

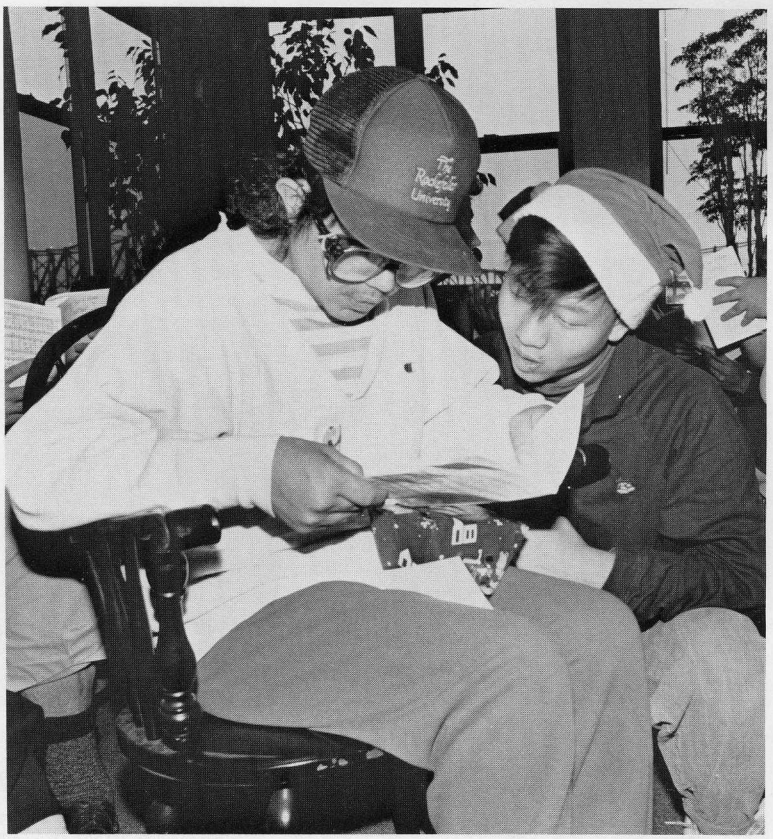
Education, especially among health care personnel in poorer countries, has been suggested as a way to monitor emerging viruses. Establishment of monitoring stations near tropical rain forests and on the outskirts of cities, where many viruses are first reported, has also been suggested. Here in the U.S. some scientists would like to see an organization to focus on outbreaks of animal diseases that may affect human health.

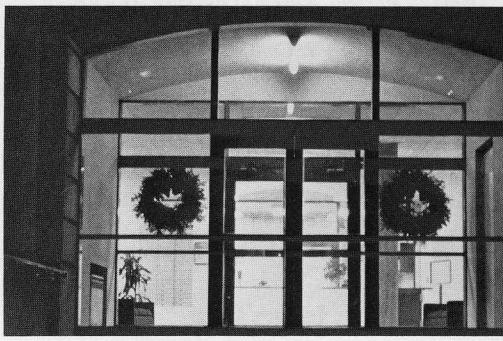
The AIDS epidemic serves as a painful and continuing reminder of our susceptibility to viral attack. Dr. Lederberg has observed that our vulnerability to viruses unifies the human race: "No matter how selfish our motives, we can no longer be indifferent to the suffering of others," he wrote recently. "The microbe that felled one child in a distant continent yesterday can reach yours today and seed a global pandemic tomorrow."□

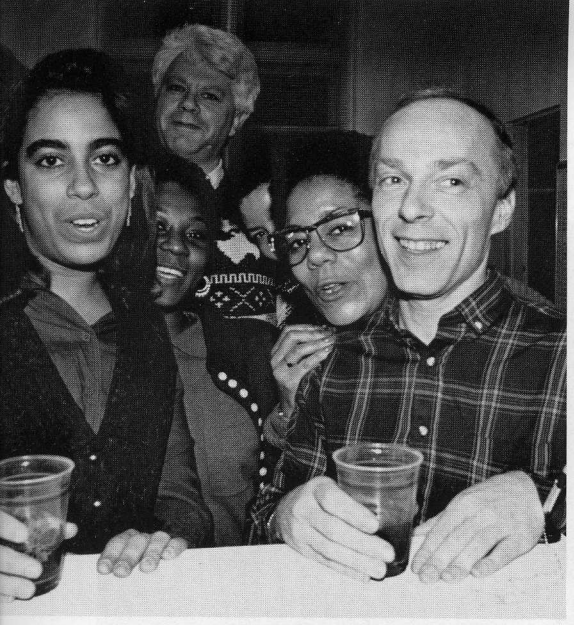
News and Notes is published five times a year from October through July. Suggestions for articles are welcome and may be sent to *News and Notes*, Box 68, or call extension 8967. Photographs: Media Resources Service Center, except page 1, lower left, and page 6, lower left, Robert Brown; and page 2, top, page 7, top left and right, and page 8, Rockefeller Archive Center. Printed in the United States of America.

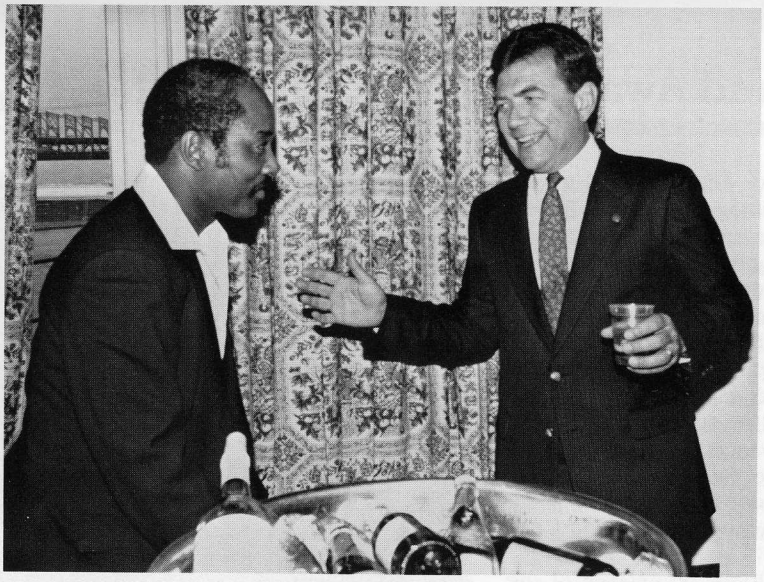
Scenes of the Season

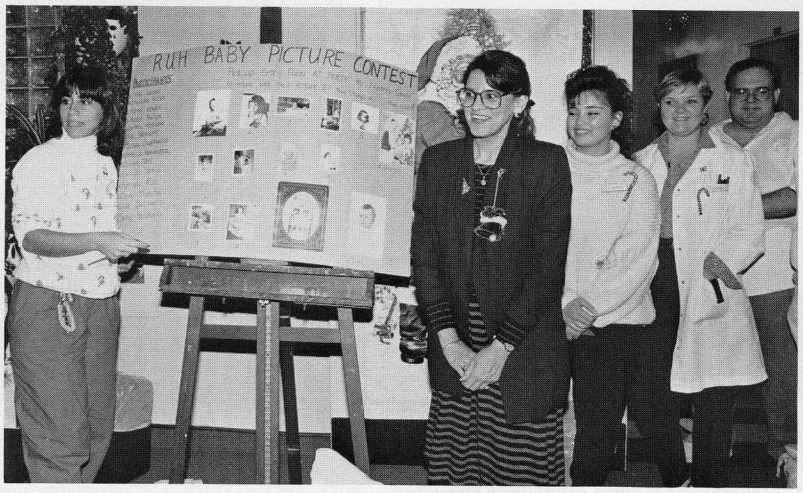


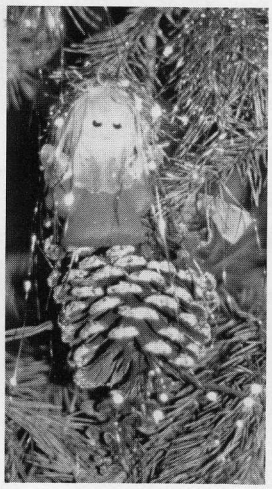


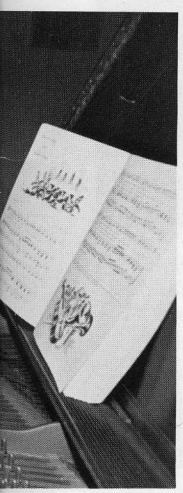


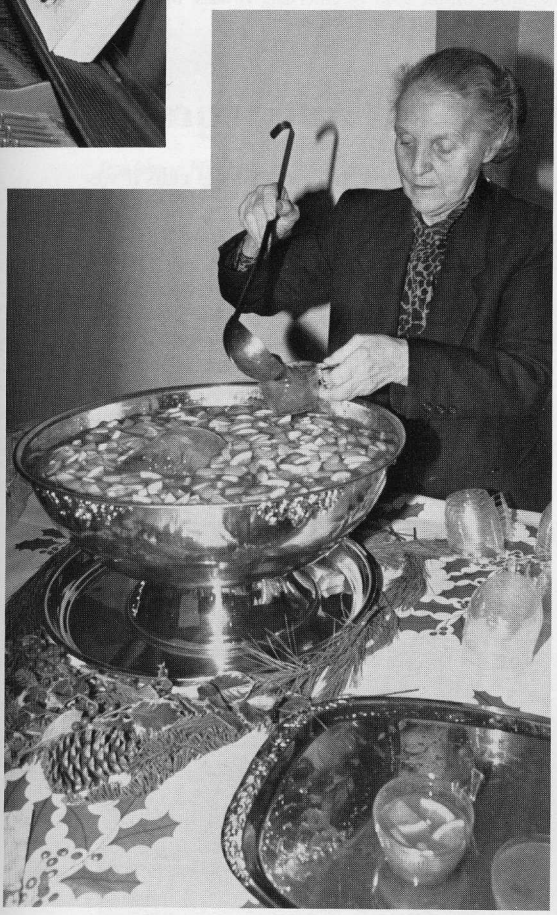


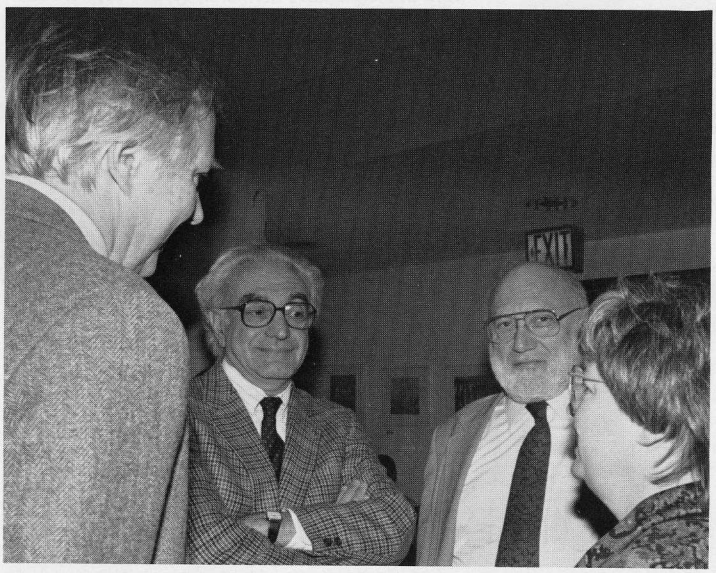



RUH BABY PICTURE CONTEST





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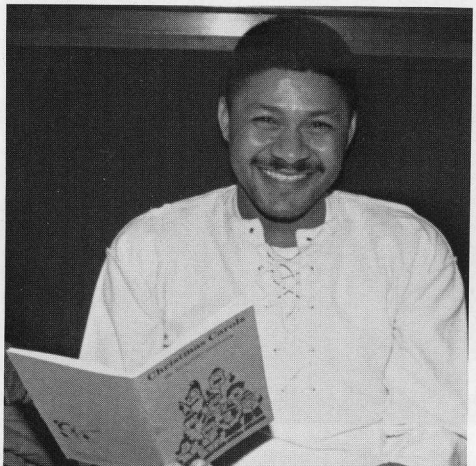
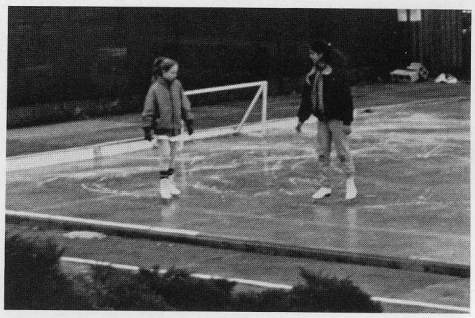

Christmas Carols



Honors and Awards

In October, Professor **Günter Blobel** of the Laboratory of Cell Biology received the Waterford Biomedical Science Award, an international prize consisting of a crystal trophy and cash prize from Waterford Glass Ltd. of Ireland. The award, administered by the Research Institute of Scripps Clinic, was presented to Dr. Blobel to "recognize signal contributions to biomedical sciences and thereby to encourage the fundamental research through which practical medical advances are realized." Professor Blobel is the fourth scientist from Rockefeller to receive this prestigious prize since it was established in 1977.

Assistant Professor **Elaine Tuomanen** of the Laboratory of Microbiology has been presented the Career Investigator Award from the American Lung Association for her work on the *Bordetella pertussis* bacterium. The award will fund one year of research on this bacterium, which is the cause of whooping cough.□

Promotions

Ronald C. Beavis, Mass Spectrometry and Gaseous Ion Chemistry, to Assistant Professor.

Thelma A. Chen, Cell Biology, to Assistant Professor.

Christine E. Clayton, Molecular Parasitology, to Associate Professor.

Gloria Coruzzi, Plant Molecular Biology, to Associate Professor.

Werner Graf, Neurophysiology, to Associate Professor (reappointment).

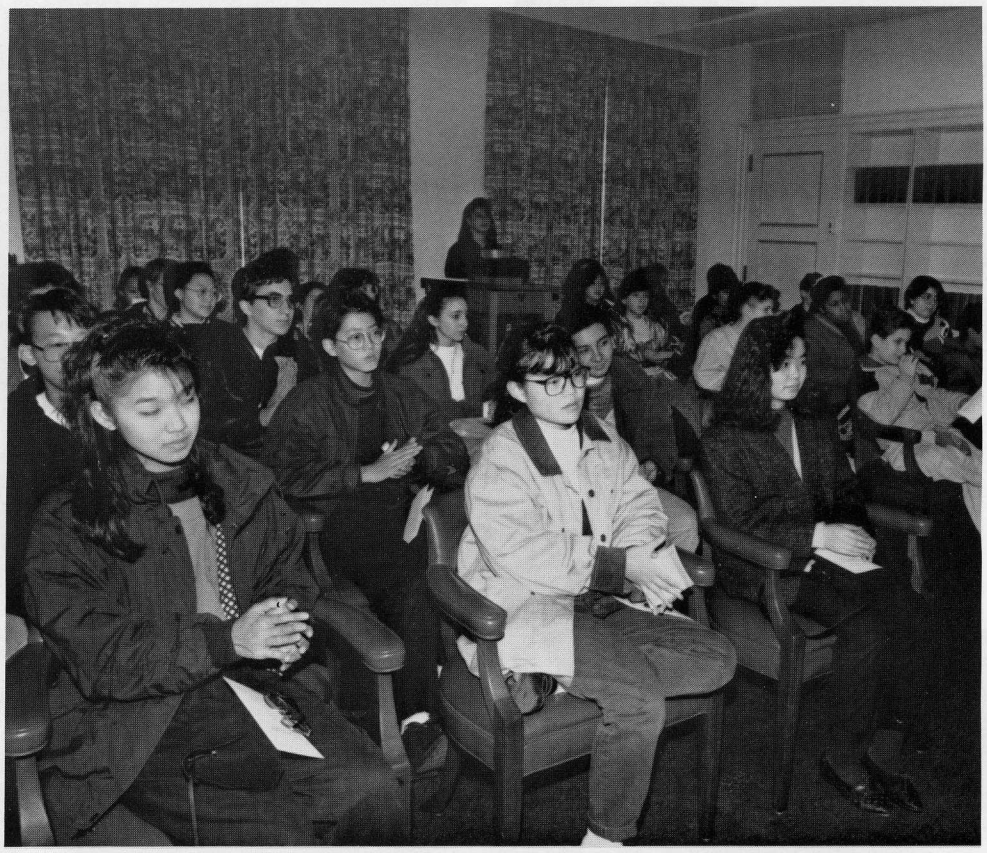
Robert Mackel, Motor Physiology, to Associate Professor.

Hai-cang Ren, Theoretical Physics, to Assistant Professor.

Kang Tsou, Molecular and Cellular Neuroscience, to Senior Research Associate.

Helen Vlassara, Medical Biochemistry, to Associate Professor.□

Inspiration 101



Biology students from The Bronx High School of Science enjoyed a morning of scientific discovery when they visited the university on November 10. After watching videos about the university, the students had their choice of visiting one of three Rockefeller researchers: Dr. D. Martin Carter, who introduced students to his work in investigative dermatology; Dr. Stephen Morse, who spoke on the issue of emerging viruses; or Dr. Bruce McEwen, who discussed the interaction between the endocrine system and the brain.

Recycling Update

A study undertaken by New York City indicates that as much as 70 percent of the trash generated in an office building can be recycled and reused. With this statistic in mind, a recycling program was initiated on campus last August to enable university members to contribute to a better environment. So far, the program has been very successful.

"Frankly, we've been a little surprised at how well the campus as a whole has responded to our call to recycle," comments Tom Mineo, Supervisor of Custodial Services. "At first the reaction was mixed, but now we get calls if we miss a container."

The simple system, designed with assistance from the Office of Paper Recycling, Council on the Environment of New York City, involves providing everyone on campus with green folders to use in the collection of personal waste paper. This paper is dumped into over 100 bins or boxes located around campus for nightly collection by the housekeeping staff. Dealers buy the waste paper from the university at a rate of $10 per cubic yard.

All white bond paper is reusable, including typing and copier paper, white bond computer paper, and even computer tab cards. Employees are asked to note that nonrecyclable materials should not be put in the grey pick-up dumpsters marked as bins for recyclables because these must be separated out by the dealer.

The university hopes to begin programs for recycling glass, cans, and newspapers by the middle of this year. Peter Cassidy of Custodial Services has been assigned to oversee the university recycling project on a part-time basis. Any questions regarding recycling should be directed to Peter Cassidy or Tom Mineo, x8117.□

Rockefeller Retrospective

Karl Landsteiner: Research in His Blood

Dr. Karl Landsteiner, a member of the Rockefeller faculty from 1922 until his death in 1943, dedicated his life to the study of blood. Born in Austria in 1868, he attended medical school at the University of Vienna and, after graduation in 1891, chose a career in laboratory research over establishing his own medical practice. As fate would have it, this single decision allowed him to save many more lives than would have ever been possible in private practice.

Dr. Landsteiner's early work in Austria focused on a question that had puzzled the medical profession for 230 years: Why did transfused blood revive some patients and throw others into convulsions? At the age of only 33, he answered this question with the discovery that there are different types of human blood.

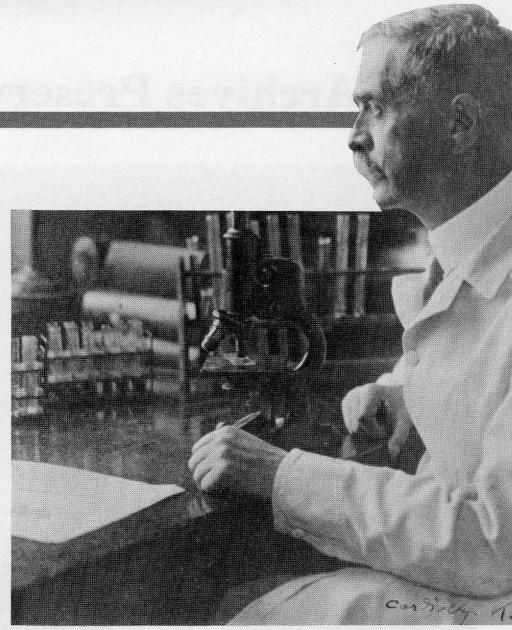
In 1901 Dr. Landsteiner classified human blood into groups A, B, AB, and O—the blood classification system we still use today. His discovery of blood types and their categorization is an important milestone in the history of medicine, although it was not recognized as such for several decades.

In addition to his work with blood groups, Dr. Landsteiner was involved in the field of immunochemistry. By 1914 he had focused on a task that would occupy him throughout the rest of his life: the chemical study of biological processes, especially those of immunology.

However, post-World War I problems of national poverty and the advance of communism in Austria interrupted Dr. Landsteiner's work and caused him to move his family to Holland. He remained in The Hague, working in a small hospital, until 1922 when he came to the United States and The Rockefeller Institute for Medical Research at the invitation of its Board of Directors. He and his wife later became naturalized citizens.

At Rockefeller Dr. Landsteiner equipped his laboratory for chemical research and began studies of blood antigens, foreign substances that stimulate an immune response. Among his important discoveries during this period was the identification of the Rh factor in blood. The Rh factor is associated with fetal erythroblastosis, a disorder that causes intrauterine death. His discovery made possible a treatment for the disorder, which involved replacing the diseased blood of the newborn with healthy donated blood. The steps involved in this process, which has saved the lives of countless children, are all possible specifically because of Dr. Landsteiner's research.

Dr. Landsteiner's advances in studies of human blood at Rockefeller in the late 1920s renewed attention to his work on blood groups earlier in the century. As a result, he was awarded the Nobel Prize in Medicine in 1930.



In 1939 Landsteiner became an emeritus member of the Institute, continuing his daily work in the laboratory. In his later years, he showed that drug allergy should be included in the general category of typical immune reactions. During the Second World War, he tried unsuccessfully to find ways to immunize soldiers against mustard gas.

When he died suddenly of heart failure in 1943, Dr. Landsteiner was studying the chemical relationship between antibodies and antigens. He left behind an enormous body of published work and accomplishment, which deeply influences those who work in the field today.□

News and Notes

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