

5-15-1992

## NEWS AND NOTES 1992, VOL.2, NO.33

The Rockefeller University

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### Recommended Citation

The Rockefeller University, "NEWS AND NOTES 1992, VOL.2, NO.33" (1992). *News and Notes 1992*. Book 18.  
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## Dial '327' to reach RU

Today (May 15) the university's 570 telephone exchange will be replaced by a new exchange—327.

"At 5:30 P.M., all telephone and data lines on the 570 exchange will cease to operate," said Portia Goodman, manager of Telecommunications Services. "Please don't schedule important conversations or data transmissions on the 570 exchange around this time, because they will simply be cut off. The 327 lines will be up and running about 15 minutes before this."

Telecommunications staff and AT&T technicians will work until 10 P.M. tonight and from 8 A.M. to 10 P.M. Saturday to fine-tune the new system, collect many of the old phone sets, and replug faxes and modems into the new jacks.

A Help Desk will open Monday with staff on hand to answer questions and address concerns from the Rockefeller community about the new system. To reach the Help Desk, call x1100 between 8:00 A.M. and 5:00 P.M.

## Wiesel meets with elected officials

President Torsten Wiesel met last Friday with State Senator Roy M. Goodman and a dozen other elected officials and community leaders to discuss issues of mutual concern. The breakfast meeting, part of a series of Wiesel's "good neighbor" initiatives, was marked by a friendly and cooperative spirit.

Goodman led a delegation that included State Assemblymen John Ravitz and Alexander B. "Pete" Grannis, and Councilman Charles Millard. Both Grannis and Millard had previously met with Wiesel (see *News&Notes*, March 27). A representative from Congressman Bill Green's office also attended.

Community Board 8 sent three members to the meeting: District Manager Ed Benson; Richard Burg, co-chair of the Environment and

Sanitation Committee; and member Joanne Rashbaum. Barry Schneider, of the E. 60th St. Neighborhood Association, was also present.

Goodman opened the meeting by thanking Wiesel for withdrawing Rockefeller's petition to incinerate low-level radioactive waste. Saying that "your decision was exceptionally important for the community," Goodman praised the university's quick response.

Wiesel said he was committed to working with the community. He introduced Ingrid Reed, the university's new vice president for public affairs and corporate secretary, emphasizing her strong record in community relations; he also mentioned his appointment of Doron Weber, manager of public affairs, who was also present, to act as his spokesperson at community meetings. Rashbaum and Burg agreed that relations between Rockefeller and the community had improved noticeably in recent months.

Ravitz stated that the problem of waste disposal was still unsolved. Grannis pointed out that as of January 1993 the states that now dispose of low-level radioactive waste for the rest of the country—Nevada, Washington, and South Carolina—would stop accepting shipments. He discussed some of the options for waste disposal and said he hoped biomedical institutions would provide leadership and advice. Millard said it was important to keep lines of communication open.

Speaking for the entire group, Goodman thanked Wiesel. He promised to keep the university informed about legislation and asked that Rockefeller keep officials informed of any scientific consensus that emerges about waste disposal.

## RU Council hears about the changing brain

by Susan Blum

The complex brains of higher animals endow those creatures with the flexibility and adaptability they need to survive and to thrive. Now, new discoveries—many of them made here at The Rockefeller University—are demonstrating that the brain itself is a remarkably flexible and adaptable organ, capable of undergoing dynamic change throughout life.

How the brain changes—for good and ill—was the subject at a recent meeting of The Rockefeller University Council. President Torsten Wiesel began the day's events by describing how certain aspects of the brain's capabilities are affected by experience during "critical periods" early in life. Vision is one example. As Wiesel and his colleague, David Hubel, showed in the 1960s when both were researchers at Harvard, the development of vision depends not only on a brain apparatus capable of responding to visual stimuli, but on the visual stimuli themselves. Their discovery explains why children born with normal brains but with

congenital cataracts or other eye disorders remain blind or severely sight-impaired if the eye defects are not surgically corrected very early in life. Deprived of the proper visual experience during this critical period, the brain can never recapture its lost potential. The same is true for language use, arguably humans' most distinguishing characteristic. As a long, sad history of case studies shows, children deprived of normal linguistic interactions in their early years cannot employ the full range of language's potential.

### Change is a constant

But the existence of critical periods does not mean that the properties of brain cells are fixed by the end of childhood, Rockefeller investigator Charles Gilbert told the group. "On the contrary," he said, "our recent work shows that well into adulthood our brains are constantly undergoing a process of dynamic change."

Like Wiesel, with whom he has long collaborated, Gilbert studies the visual cortex, the brain region that analyzes and interprets the world of information that reaches us through our eyes. The more Gilbert and his colleagues learn about these processes, the more essential the brain's flexibility appears to be.

Information from the visual world is "mapped" on the cortex topographically. Light falling on the retina from a particular part of the visual field is transformed into an impulse that reaches a particular

cell in the visual cortex. "Each cell has just a tiny window on a minute part of the visual world," Gilbert said.

Through that window, the neuron not only receives visual information, but also makes an initial attempt to analyze it. About 30 years ago, Wiesel and Hubel's investigations (which won them a Nobel Prize) disclosed that, within the small set of cortical cells responding to a particular part of the visual field, different cells "like" edges with different orientations—horizontal, vertical, or slanted at particular angles. Each individual cell responds to just one sort of edge and no other.

How does the brain integrate these short, oriented edges into a unified object? The answer may lie in a type of neuron-to-neuron

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2 Lederberg Lecture features geneticist

4 Historical photo: home on the farm



President Torsten Wiesel met with elected officials and community leaders last Friday. On Wiesel's left is State Senator Roy M. Goodman; on his right is State Assemblyman John Ravitz.



## RU scientist speaks to committee

John Sholtis



Professor Michael W. Young (above) gave the keynote address at the Committee on Trust and Estate Gift Plans dinner Tues., May 12. One hundred friends and benefactors of the university attended the event. Frederick A. Terry, Jr., chairman of the committee, and President Torsten Wiesel introduced the evening's program.

### Computer notes

## Modem offers more lines, faster service, automatic dialing

The outgoing modem service on the central computer has been upgraded.

- A dialer pool now exists on rockyj with more outgoing lines. The pool ensures that if one line is busy users will automatically be transferred to the next free line. The rockyj dialers replace those which used to exist on rocky2 and rocky7.
- 2400 baud service is now available, enabling faster connections and data transfer. In the future, Computing Services hopes to upgrade the dialers to 9600 baud and beyond.
- The Laboratory Safety computer

can now be reached through automated dialing.

The "tip" command, used for dialing, is given as follows: tip - baudrate telephone number. For frequently used services such as reaching the BRS and DIALOG databases and the Lab Safety computer some or all of this information is bundled into one command. For example, to reach Lab Safety the command is "tip labsafety" which includes the baud rate and telephone number of the Lab Safety computer. Baud rate, telephone number, and the tip command are packaged together in the BRS and DIALOG commands

which are simply "DIALOG" and "BRS".

The tip command makes a connection with an outside computer and continues to run while the user works on that computer. Therefore, when users are finished they must disconnect from the outside computer and end the tip session so that others can use the outgoing lines. To end tip, press the Return or Enter key, then use the command: "~".

On-line and printable help for using tip is available on most Rockefeller computers by using the command "help tip". The DIALOG and BRS commands are designed for those already familiar with the databases; questions should be addressed to Patricia Flowers, library assistant, x8917.

For more information about tip and the dialers, contact the computer consultant, x8940, or send e-mail to *consult*.

### Letter to the editor:

As you know, on Fri., May 1 there were rumors of civil disturbance in the city. Many companies dismissed their employees at 3:00 P.M.

Despite these events, we were able to achieve 100 percent attendance [including the evening shift] that day. I would like to take this opportunity on behalf of The Rockefeller University to thank the Custodial staff for the great effort they made to come in to work that day.

Sincerely,

Tom Mineo

Supervisor, Custodial Services

## Lederberg Lecture features geneticist

Luigi Cavalli-Sforza, chairman of the Department of Genetics at Stanford University, will speak at the Joshua Lederberg Distinguished Lecture in Molecular Genetics Fri., May 22. Cavalli-Sforza, who received his medical degree from the University of Pavia, began his research on bacterial genetics in 1942, focusing first on measuring bacterial virulence and resistance to radiation and then on bacterial conjugation.

He discovered the first Hfr (High Frequency of Recombination) strain in *Escherichia coli*, and later the two different mating types, F+/F-. Similar and mutually complementary discoveries were made independently by Joshua and Esther Lederberg, then at the University of Wisconsin, and the researchers decided to publish jointly.

In the early 1950s, Cavalli-Sforza turned his attention to human population genetics. His research, conducted in Parma and later in

Pavia, included the demonstration of genetic drift by a joint analysis of demographic and genetic population data in the Parma Valley; the prediction of the dynamics of marriage among close relatives; and the study of human genetic history using new methods to reconstruct phylogenetic trees.

In 1970, Cavalli-Sforza accepted a long-standing offer by Lederberg to join the Department of Genetics at Stanford University, where Lederberg then served as chairman. Cavalli-Sforza became chairman in 1986. His work at Stanford has included the presentation of a hypothesis on the spread of agriculture from the Middle East in early neolithic times; the study of gene geography by synthetic maps; the mathematical prediction of cultural transmission and evolution; and, most recently, a study of the relations between linguistic and cultural evolution.

The annual lecture was endowed by the Raymond and Beverly Sackler Foundation in Lederberg's name. Lederberg, who has held a variety of advisory positions in government, was president of Rockefeller from 1978 to 1990.

A graduate of Columbia College and Yale University, Lederberg discovered a "sexual breeding" system whereby two bacteria form a connecting bridge through which one passes a chromosomal strand to the other. This discovery helped to make bacteria available for genetic research and, later, for biotechnology. His work earned a Nobel Prize in Medicine in 1958.

Now University Professor at Rockefeller, Lederberg studies the way in which DNA can vary in its conformation, how this is influenced by the environment, and how DNA may in turn affect the localization of gene mutations.

## 28 ways to reach your audience

An expanded list of label categories is available as part of Telecommunications Services's database service. The database, established to create The Rockefeller University telephone directory, can provide labels for 28 different categories of mailing lists.

While normal requests require 24 hours notice, rush requests can often be accommodated. Requests should be placed with Jackie Mulero, x7759. Beginning Mon., May 18, labels should be picked up from Nurses Residence 109.

The categories that can now be requested are:

1. All members of The Rockefeller University
2. All faculty
3. All administration
4. Non-faculty
5. Senior faculty
6. Junior faculty
7. Population Council faculty
8. Adjunct or visiting faculty
9. Guest investigators
10. Postdocs
11. Research associates
12. Senior research associates
13. Lab heads
14. Service heads
15. Administration - general
16. Senior administration
17. Junior administration
18. Students
19. Calendar of Events
20. Memorial Sloan-Kettering calendar
21. Buildings
22. Male/female
23. Professors
24. Assistant professors
25. Associate professors
26. Professors Emeritus
27. Administrative assistants/secretaries
28. Tenured faculty

News&Notes is published each Friday throughout the academic year by The Rockefeller University, 1230 York Avenue, New York, NY 10021. Phone: 212-570-8967.

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# RU Council hears about brain

(Continued from page 1)

connection that Wiesel and Gilbert have studied since the late 1970s. They have found that neurons in the visual cortex have very long axons that course horizontally for great distances across the cortical surface. (An axon is the part of the nerve cell that contacts neighboring cells to transmit a message). By linking cells that respond to edges with similar orientations located at disparate points in visual space, "these horizontal connections may be the way different parts of an image are bound together," Gilbert said.

## Dynamic Connections

Remarkably, the connections are proving to be very dynamic. Judith Hirsch, a research associate in Gilbert's lab, has found that the strength of the connections can change in response to alterations in sensory input. According to Gilbert, such plasticity might go a long way toward explaining both moment-to-moment perception and long-term memory. Throughout life, we must constantly perceive new objects and people, and then store the new percepts in memory. Scientists used to assume that a part of the brain quite distant from the visual cortex provided the necessary flexibility to effect information storage. Now it appears neurons in the visual cortex themselves possess the requisite flexibility.

Essential for normal brain functioning, horizontal connections are probably involved in recovery from brain injury, too. In recent investigations with anesthetized animals, Gilbert and Wiesel "silenced" cells in the visual cortex by lesioning the retinal regions that provide input to them. Surprisingly, they found within a period of about two months the brain cells could respond once again—but this time to input from a region in the retina next to the lesion. "Effectively, we altered the map of visual space on the surface of the cortex," Gilbert explained. One part of the map shrank and another expanded as the cortical neurons gained new functions through alterations in the horizontal connections. The researchers are now investigating the molecular and physiological details of this cortical elasticity.

Though different cortical regions handle different functions, such as hearing, movement, and language, "one area is very similar to another in terms of the numbers and kinds of cells and the pattern of connections between them," Gilbert said. Thus, he summed up, insights into how the visual cortex works under normal and pathological conditions may yield keys to the functioning of the cortex as a whole.

## New neurons are born

Arturo Alvarez-Buylla described to the assembly another astonishing aspect of the brain's lifelong dynamism: adult neurogenesis, or the birth of new neurons.

In embryonic birds and mammals, neuronal progenitors are born in a region known as the ventricular zone and then migrate long distances through the brain. At their final destination, they mature and differentiate into functioning neurons.

Until about a decade ago, it was a dogma of neurobiology that neurogenesis ceased after embryologic development. But then Rockefeller's Fernando Nottebohm and his colleagues discovered that adult canaries gain new neurons each year. The neurons are added throughout the forebrain, including a song-control region known as the HVC, or higher vocal center.

Nottebohm and his colleagues, including Alvarez-Buylla, have been pursuing the details of that revolutionary discovery ever since. By now, said Alvarez-Buylla, it is known that adult bird brains display a similar pattern of neurogenesis, migration, and differentiation as those of developing embryos. Moreover, some of the newborn neurons become projection neurons—nerve cells that link up with distant areas of the brain.

In adult male canaries, neurogenesis (and particularly the birth of projection neurons that link two important song-control regions) is clearly related to their need to learn a new song every year in the fall. But why do male canaries also gain new neurons in the spring, when their song is stable? And why is there neurogenesis in zebra finches, who sing the same song throughout life? One hypothesis is that adult neurogenesis is related to other forms of learning, as well, and is therefore useful to any winged creature that may need to modify circuits either for vocal communication or other functions.

## Potential for brain repair

As delightful as bird song is to humans, the neurogenesis that underlies it may provide more direct benefits to our species. "Any of the processes involved in adult neurogenesis could be extremely useful to repair brain damage when it is so great that the brain can't recover without new nerve cells," said Alvarez-Buylla.

The similarity between adult avian neurogenesis and neurogenesis in mammalian embryos is one reason for hope. Even more exciting are promising preliminary results of research now taking place in Alvarez-Buylla's lab on adult neurogenesis in rodents. There is much yet to learn about



Charles Gilbert, Arturo Alvarez-Buylla, and Paul Greengard (from left to right) at the recent Rockefeller University Council meeting.

the conditions and chemicals that control the birth, migration, and differentiation of new neurons in adult animals. "But," said Alvarez-Buylla, "if we can find out what it takes to get neurogenesis going in an adult environment, we might eventually be able to encourage the process when it is desirable."

## Master proteins change

Ultimately, the dynamic alterations the brain undergoes are due to changes at the molecular level affecting the structure and function of brain cells. Paul Greengard is a pioneer in the study of a class of "master molecules" that control virtually every cellular event in the body.

They are called "phosphoproteins"—proteins whose shape and function are changed through the addition or subtraction of a highly-charged substance called phosphate. There are more than 200 phosphoproteins in the brain, Greengard told the assembly.

One of them is synapsin. Synapsin is localized at the message-transmitting end of a nerve cell, close to the small gap (the synapse) that separates the cell from the neuron destined to receive the message. A few years ago, Greengard discovered that changes in synapsin's state of phosphorylation determine whether a nerve cell can send its message via chemicals called neurotransmitters.

Recently, Greengard reported, work by Hui-Quan Han in his lab disclosed a new and dramatic role for synapsin—that of actually inducing synapse formation. The effects of synapsin on a neuron are profound: its nerve endings proliferate, it acquires many more sacs of neurotransmitters, and its ability to establish functional connections with target cells appears to be greatly enhanced.

Greengard said this discovery may yield clinical applications for conditions such as Parkinson's and Alzheimer's Disease, which are characterized by neuronal degeneration. "If we can find out how synapsin causes its dramatic changes in nerve cells, it might be possible

to develop drugs that mimic its effect," he said. "Then, in the early disease stages, we might be able to prompt surviving cells to establish new contacts and take over the function of dying nerve cells."

## A clue to Alzheimer's

Therapeutic prospects for Alzheimer's disease are also emerging from the Greengard lab's study of another master phosphoprotein, dubbed APP. Like many proteins in the body, APP must be processed; in neurons, it is processed via two different pathways. The normal processing pathway results in a protein believed to play a role in communication between neurons. The abnormal pathway results in a fragment called beta-amyloid, the major constituent of the tangled, fibrous brain plaques that are the hallmarks of Alzheimer's disease. Beta-amyloid is toxic to neurons and, says Greengard, "there is good reason to believe that it may be the cause of Alzheimer's disease."

Throughout life, the amount of the normal protein remains constant in the brain. But with increasing age, a possible precursor to beta-amyloid starts to build up; unless it is degraded, toxic beta-amyloid might eventually accumulate, as well. Experiments in the Greengard lab have shown that phosphorylation determines the balance of APP processing: an overabundance of phosphate causes the abnormal processing pathway to predominate.

These discoveries hold promise for the treatment of Alzheimer's disease. "We're hopeful of finding ways to control the relative routes of APP metabolism by controlling the degree of phosphorylation," Greengard told Council members.

The dynamic brain will not yield all its mysteries overnight. But research conducted by investigators currently at Rockefeller—and by those being actively recruited—will continue to yield fascinating insights resulting from one of nature's most remarkable phenomena: the ability of the human brain to investigate its own activity.



## Potpourri

### Spraying

Weather permitting, the trees and shrubs on campus will be sprayed Sat., May 16, from 6:00 A.M. to noon. The Grounds Department recommends that those on campus that day stay out of *direct* contact of the drift, close windows, turn off air conditioners, and keep pets inside. The rain date is Sat., May 30. For more information, contact Jim Sullivan, x8001.

### Sunday film

*Compulsion* (1959, Richard Fleischer). Based on the Leopold-Loeb murder of the 1920s, this film is about two University of Chicago students who decide to commit the perfect murder. Orson Welles stars as Clarence Darrow, the attorney who defends the students to save them from the electric chair. Dean Stockwell and Bradford Dillman also star. The film will be shown Sun., May 17 at 7:30 P.M. in Caspary Auditorium. Admission is free and all are welcome.

### Tri-Institutional Noon Recital

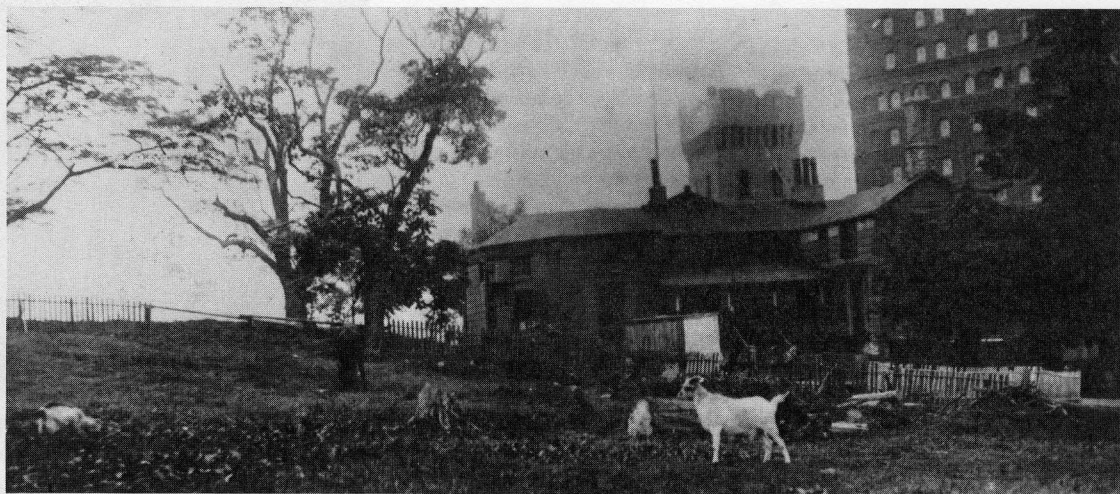
Violinist Juliette Kang and pianist Robert Koenig will perform works by Dompierre, Fauré, Bloch, and Szymanowski at Tri-Institutional Noon Recital today (May 15). Kang won the 1989 Young Concert Artists International Auditions at age 13, the youngest artist ever to do so. Koenig, the recipient of several awards from the Canadian government, is establishing a reputation as a sought-after collaborative artist and chamber musician.

Next Friday (May 22) Tri-Institutional Noon Recital will feature the Fidelio String Quartet performing works by Haydn, Panufnik, and Beethoven. Prize-winners at the 1991 London International String Quartet Competition, the Fidelio String Quartet brings together four outstanding young musicians—Helene Pohl and Steven Miller on violin, Caroline Wolff on viola, and Gregory Sauer on cello.



Violinist Juliette Kang will perform at Tri-Institutional Noon Recital today (May 15).

## Home on the farm



The Schermerhorn farm house—located on the site of today's campus—was built in 1747 and assumed its name after Peter Schermerhorn purchased it in 1803. This picture shows what the house looked like in the early 1900s. It was demolished around 1914.

The recitals, held in Caspary Auditorium, are free and open to the Tri-Institutional community.

### Long-term care seminar

Those concerned about paying for nursing home or home care for themselves or a relative may be interested in learning about long-term care insurance. A seminar on this topic will be held Wed., May 20, 6:00 to 7:30 P.M., in Nurses Residence 110B. An additional seminar has been scheduled for Thurs., May 21, 1:00 to 2:30 P.M., Nurses Residence 110B.

### FSA seminars

The Personnel Office will conduct two workshops on flexible spending accounts (FSAs), Mon., May 18. Call Darryl Williams, x8297, or Ginny Hansen, x8299, to make an appointment to attend the 10:00 A.M. session in Tower 305 or the 5:30 P.M. session in Tower 301.

### Reception

The university community is invited to a reception for Barbara Adams who is retiring after 25 years service as educational director of The Rockefeller University Children's School. The reception will be held on the 17th floor of Tower, Wed., May 27, 3:00 to 5:00 P.M. Those who wish to contribute to the purchase of a farewell gift are asked to send their contributions to Jean Clement, Box 219.

### Colloquium

Bristol-Myers Squibb Pharmaceutical Research Institute will sponsor a cardiovascular colloquium Wed., May 20, in Caspary Auditorium. Topics will include: the genetic and molecular mechanisms of hypertension; the molecular structure of angiotensin I-converting enzyme (ACE); growth factors and cardiovascular development; signal transduction by PDGF receptors, FGF receptors, and by a

recently identified receptor for vascular endothelial growth factor/permeability factor; and the adrenergic receptors. To preregister, call Betty Gualfetti, (609) 252-5646.

### Protein seminar

Hewlett-Packard Company will sponsor a seminar "Innovative Techniques and Technologies in Protein Characterization" today (May 15) from 9:00 A.M. to 4:00 P.M. in Tower 305. Michael F. Rohde, lab head of protein structure at Amgen, Inc., and representatives from Hewlett-Packard will speak. Equipment will also be demonstrated. Registration will be held at 8:30 A.M.

### Award

The American Federation for Clinical Research has awarded Elizabeth R. de Oliveira e Silva, research associate in the Breslow lab, a Henry Christian Award for Excellence in Research. The award, established in honor of Henry Christian, founder of the American Federation for Clinical Research (AFCR), is given for abstracts with the top two grades in each subspecialty submitted to the AFCR. Silva's abstract, written with R. Arnberg and Cynthia Seidman (Rockefeller's director of Dietary Service), is entitled "Environmental and Genetic Considerations in Plasma Lipoprotein Levels in Identical Twins."

### Recycling

The Rockefeller University is now recycling Hewlett-Packard toner cartridges. The cartridges returned to Hewlett-Packard are used to manufacture new ones and are melted down for use as raw material. For every return, the company makes a \$1 donation to environmental groups. Individuals can drop off used cartridges—packed in the box from a new cartridge—in

receptacles in the stockroom or the 68th St. receiving area. For more information, contact Robert Luckey, x8199.

### Software

Version 2.00 of ASP (A Statistical Package) is now available from Computing Services. ASP is a menu-driven package of statistical commands which runs on the IBM PC. New features included in this version include: Fisher's R to Z transformation; actual, estimated and residual values for the output of regressions and analysis of variance options, and an F test for the equality of two variances. Improvements to plotting include scalable plots. ASP is distributed free in exchange for a blank diskette. For more information contact the consultant, x8940.

### Free checking

Citibank is offering free checking services for one year—effective May 1, 1992—to Rockefeller faculty and staff who have or who plan to open a direct payroll deposit account at Citibank. For more information, contact Citibank's Carlo Migliorini, 249-4550.

### Spring special

Peter's Car Service is having a spring special for Rockefeller University students, faculty, and staff: \$15 to LaGuardia airport, \$26 to Newark airport, and \$25 to John F. Kennedy airport. Pickups can also be arranged. Call 898-8247.

## News&Notes takes a vacation

News&Notes will not be published Fri., May 22 due to the Memorial Day weekend. Publication will resume May 29.