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Energy Report: The Bad News and the Good News

As the fiscal year comes to a close, one of the most critical factors affecting the University's vitality and financial health is energy. As Controller David Lyons explains, "Our University, unlike some others which are not wholly scientific in nature, is energy-intensive and can only become more so as our research grows more complex. The problem is not going to go away. It is therefore essential that every member of the University community understand it and understand the role that each can play to add to the effectiveness of the energy conservation programs being put into operation."

Here are a few significant statistics:

■ In 1973, energy represented 10 percent of the overall cost of maintaining the University's physical plant. It now represents almost 60 percent. This means \$2.6 million out of a budget of \$4.5 million.

■ In 1973, the University paid 14 cents a gallon for fuel oil. As of April 1, the price was 40 cents. The University burns an average of 1.8 million gallons annually. Each penny rise, therefore, represents \$18,000 a year. (The situation was exacerbated, of course, by the extraordinary winter just past, during which, in the jargon of the weathermen, the number of so-called "degree days" was 30 percent above normal.)

■ Defined as a "commercial" consumer of electricity, the University is billed by Con Edison on the basis of two measures: actual consumption and what is called "peak demand." One part of the bill covers real kilowatt-hours used.



David Lyons, left, and Thomas McGinnity inspect heat exchange system.

The other part represents the maximum rate of usage reached at the peak consumption time during the billing period. As an analogy, if a driver averaged 50 miles per hour on the highway during a trip but at some point, for a brief stretch of road, hit 70 miles per hour, under a "demand" system, he would be charged at the rate of 70 mph for the period of the journey. In real terms, ten cents worth of wattage, expended at a time when it raises the overall peak demand, can actually cost the University ten dollars. This is why what may seem like "nickel and dime" attempts at saving are very important.

Despite a grim situation, there is some good news and real cause for pride. Mr. Lyons, who has been in regular communication with a number of institutions across the country, states that "Rockefeller University is considered to be leading in sophisticated, cost-effective energy conservation techniques."

In January 1973, President Seitz established an energy committee, under the chairmanship of Thomas P. McGinnity, director of physical facilities, which immediately began work on "quick-fix" measures covering every area of the plant. Heating, cooling, and water temperature levels were modified; night and weekend shutdowns of nonessential areas of the campus were instituted; repairs of leaks, drafts,

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GET SET TO SHOW

After a three-year interval, University artists and craftsmen will again be able to display the fruits of their talents. An exhibition is being planned for September. Notices about particulars will be sent out by Patricia Berlin, who can be reached on extension 1353.

HONORS AND AWARDS

Professor **Bruce Merrifield**, Biochemistry, received the Instrumentation Specialties Co. Award at the University of Nebraska at Lincoln on April 15, for significant contributions to the field of biochemical instrumentation. He delivered the award lecture on the subject of solid phase peptide synthesis.

steam traps, control valves, and air filtration systems were stepped up; and nonessential lighting was cut to the bone. In most of these efforts, the committee relied heavily on consultations with and suggestions and reports from individuals in every area of the University's activities. The savings effected have been impressive.

On a more ambitious level, the University has also undertaken a major program of systems conversions. Some of these projects involve considerable initial outlay of funds, but the long-term gains are expected to offset the expenses many times over. For example, a new central computer system in the power house simultaneously and instantaneously switches off unneeded systems during the midnight to 8 a.m. shift, an operation that formerly required a workman several hours to complete. The savings, in fuel and manpower, come to \$100,000 a year.

Another project involves an ingenious process of air "recapture" and recycling. In the Animal Facility, where this system is already in operation, warm internal air, including the large

amounts generated by autoclaves, cage cleaners, and even the animals' own body heat, is channeled on its passage out of the building through a heat-exchange system and used to warm incoming fresh air. In this building alone, the annual saving is \$80,000. Modifications of the system are being adapted for use in a number of other buildings on campus.

The Tower Building, designed in the era of cheap energy, has been one of the biggest energy consumption problems on campus. During its first three years of operation, two 500-ton refrigeration units went continuously. A new system is now employed in the 50 percent of the Tower not used for laboratories. Temperature can be regulated and modified with a mix of internal air, fresh outside air, and refrigerated air. Between June and December, this arrangement saved the University \$50,000.

The University runs its own power plant for generating steam to the older buildings. When the new buildings were put up, it was cheaper to buy steam from Con Edison. This is no longer the case. On April 13, the board of trustees, acting on the advice of Mr. McGinnity and the energy committee, approved a plan to convert the Tower to University-generated steam, using Con Edison as a back-up source only. The cost of the conversion has been estimated at \$145,000. The annual saving is expected to run in excess of \$120,000.

By means of another project now in the works, the University will generate its own electric power for Bronk Lab, the Graduate Students Residence, and Sophie Fricke Hall.

There is no question that we may be a little cool in the winter and a little warm in the summer. It is the hope of those responsible for the efficient management of the physical plant and of the University's finances that a reasonable balance can be achieved. Full effectiveness will depend, as Mr. Lyons asserts, on "the continued diligence and cooperation of all of us."

SAVINGS REMINDER

The University participates in the payroll deduction plan for United States Savings Bonds. Through this plan, employees may authorize the payroll office to withhold a specified amount of money each pay period toward the purchase of Series E bonds, which yield six percent interest, compounded semi-annually, payable at maturity five years after the issue date. Further information may be obtained from the payroll office, extension 1341.

BRIEFS

Professor **Jay M. Weiss**, Physiological Psychology, was an invited speaker at a symposium on depression, held at Loyola University, Chicago, April 21-22. He discussed his research, conducted in collaboration with Professor **Larissa A. Pohorecky**, on stress and neurochemical changes. Dr. Weiss and Professor **William H. Bailey** gave a colloquium on stress and cardiovascular damage at the National Heart and Lung Institute, Bethesda, in March.

Professor **Merrill W. Chase**, Immunology and Hypersensitivity, served as the moderator of the morning session of an all-day symposium on Advances in Allergy and Clinical Immunology, held at the University on May 9 under the sponsorship of the Allergy Foundation of America.

Professor **Henry G. Kunkel** has been named chairman of the Board of Scientific Consultants of Sloan-Kettering Institute, which serves as an external scientific advisory council to Sloan-Kettering.

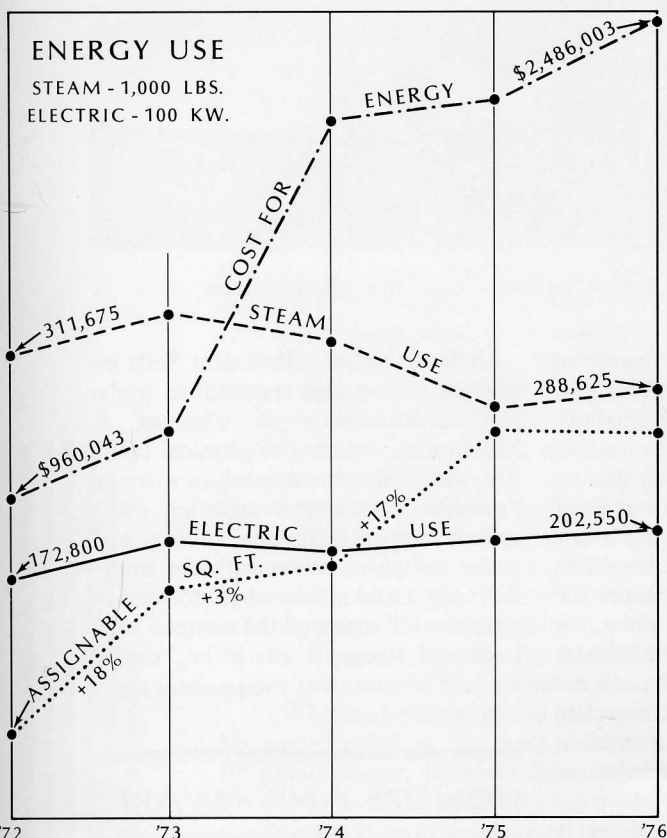
Professor **Jules Hirsch**, Human Behavior and Metabolism, was elected president of the American Society of Clinical Nutrition at the society's 17th annual meeting, held in Washington, D.C., on April 30. Professor **Carl Pfaffmann**, Physiological Psychology, served as chairman and was a principal speaker at a symposium at the meeting, on the topic of Taste in Clinical Nutrition. Other Rockefeller speakers were Professor **Joel Grinker** and Postdoctoral Fellow **Robert Contreras**.

Research Associate **Sebastian N. White**, Experimental High-Energy Physics, presented a paper on April 26 at the American Physical Society on Hadron Dissociation at 100 GeV. The paper was a report on preliminary results of an experiment currently being conducted by members of the University's high-energy physics lab at the Fermi National Accelerator Laboratory (FERMILAB) in Batavia, Illinois.

Professor **René J. Dubos**, Environmental Biomedicine, has been selected to serve on a five-member National Advisory Group on the Capitol Master Plan. The group has been set up to advise on development of the United States Capitol grounds, with regard to the future needs of the Congress, Supreme Court, Library of Congress, and related areas.

ENERGY USE

STEAM - 1,000 LBS.
ELECTRIC - 100 KW.



What this graph shows: 1) The University has grown larger in terms of the number of square feet of assignable laboratory space. 2) Despite this growth, consumption of electricity and steam has held firm or, in some instances, has gone down. 3) But the overall cost of energy has soared. (Multiply steam figures by 1000 and electricity figures by 100.)

Chromatography Subject of Library Exhibit

Currently on exhibition in the University's Library is a display of materials illustrating the early days in the development of quantitative chromatography of amino acids.

Chromatography is a technique for the separation of biological entities that was first developed at the turn of the century for the separation of plant pigments. During the last 30 years, chromatography has progressed from a relatively crude manual technique to a highly sophisticated automatic procedure of immense importance to biological research. Among the leaders in that development have been Professors Stanford Moore and William H. Stein, who were awarded the Nobel Prize in 1972 for their work in determining the complete chemical structure of pan-

creatic ribonuclease, an enzyme that breaks down RNA (ribonucleic acid). The quantitative chromatographic methods played a key role in the research that proved that ribonuclease consisted of 124 amino acid building blocks, comprising 1,876 atoms. They identified the 124 amino acid subunits and demonstrated how they fit together in the ribonuclease molecule.

Among the items on display are a 1965 photo of the two men with their automatic amino acid analyzer, photos of other early equipment, including a 1948 fraction collector built in the Rockefeller Instrument Shop, chromatographic charts and diagrams, and a copy of the 1951 *Scientific American* article in which Moore and Stein described their new automatic techniques.

Sarah Leibowitz's Pathways

Sarah Fryer Leibowitz, a member of the physiological psychology laboratory of Professor Neal E. Miller, is one of a number of scientists on campus, in several related laboratories, whose research is aimed at a better understanding of neural pathways and how the brain works to control behavior.

One of Sarah Leibowitz's most significant "discoveries" was of her own pathway. Through the years when most of her future colleagues were settling down at laboratory benches, she was perched on a piano bench. Like her four older sisters, she was headed for a place in a family line that included her mother, a distinguished pianist and accompanist, her grandmother, Louise Homer, who sang for 35 years with the Metropolitan opera, and her cousin, composer Samuel Barber. She studied at the Mannes and Manhattan music schools in New York, was a music major at the College of Wooster in Ohio for two years, and spent a year in Vienna.

It was not until after she made the difficult decision against continuing a life in music that Sarah Leibowitz realized she had been harboring a secret love for science. In a frantic two years at New York University, she "jammed together" enough undergraduate science to graduate with honors; and went on to her Ph.D., winning NYU's Yetta Karen Hirsch Award for the best dissertation in psychology.

An early interest in the effects of direct stimulation of the brain with drugs led to research concerned with the mechanism of appetite regulation. Previous findings by other investigators had shown that injection of certain

drugs into the hypothalamus—a structure at the base of the brain which regulates basic behavioral and physiological processes—induces eating behavior in experimental animals. Dr. Leibowitz established the existence of an opposing system which induces satiety. She worked out the mechanisms of these antagonistic systems (called alpha adrenergic for appetite stimulation and beta adrenergic for appetite suppression) and mapped out and characterized exact receptor sites in the brain.

A recent offshoot of this research has been a collaboration with a group at Montefiore Hospital in which Dr. Leibowitz is attempting to apply her laboratory findings to clinical studies of human appetite disorders.



USSR Visit by E.G.D. Cohen

At the invitation of the Joint Institute for Nuclear Research in Dubna, USSR, Professor E.G.D. Cohen delivered a lecture at an international symposium on Selected Topics in Statistical Mechanics, held in Dubna in April, and also visited Leningrad, Tashkent, Bukhara, and Samarkand.

The symposium was under the chairmanship of N.N. Bogolubov, director of the institute and a member of the Academy of Sciences of the USSR. In 1974, Dr. Bogolubov exchanged ideas with Dr. Cohen on the kinetic theory of dense gases and delivered a series of lectures at Rockefeller which have now been published in book form under the title, *On the Stochastic Processes in the Dynamical Systems*. The first copy of the book was presented to Dr. Cohen in Dubna. In the volume, Dr. Bogolubov acknowledges his indebtedness to the University and to Dr. Cohen for the opportunity his visit to the University gave him to familiarize himself with recent developments in kinetic theory in the West. Dr. Bogolubov paid a return visit here last month.

1977-78 Concert Schedule

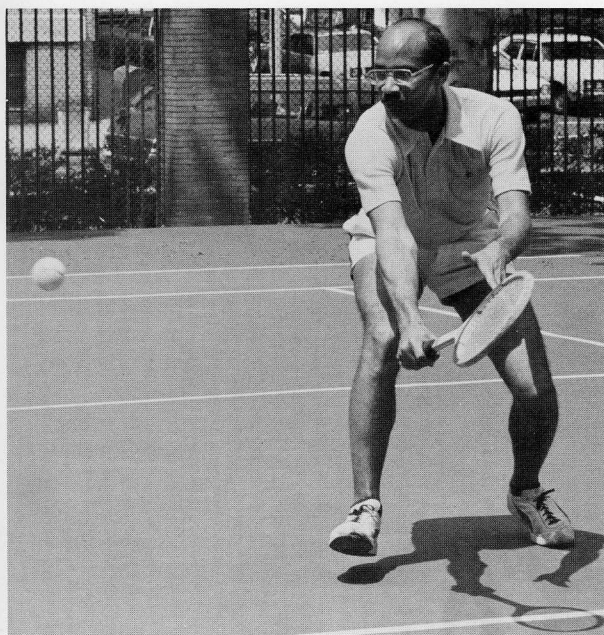
The Rockefeller University Concerts for the 1977-78 season will begin on October 12. They will be presented Wednesday evenings at 8 in Caspary Auditorium. There will be no Sunday afternoon concerts.

The schedule is: Orpheus Chamber Ensemble (October 12); Cleveland Quartet with Richard Stoltzman, clarinetist (October 26); Alexandre Lagoya, guitarist (November 9); Anthony and Joseph Paratore, piano duo (November 30); New York Vocal Arts Ensemble (December 14); Judith Raskin, soprano, and George Schick, pianist (January 25); Juliana Markova, pianist (February 8); Festival Winds (February 22); Rafael Orozco, pianist (March 1); Franco Gulli, violinist, and Enrica Cavallo, pianist (March 8); Guarneri Quartet and Friends (March 22); Garrick Ohlsson, pianist (April 5); and Guarneri Quartet with an open rehearsal from 4:30 to 6 (April 26).

A pre-concert buffet dinner will be served in the Abby dining room.

NEW POST FOR PROFESSOR JOEL FEINBERG

Professor Joel Feinberg, Philosophy, has left the University to accept a post with the University of Arizona. He retains an appointment as an adjunct professor at Rockefeller.



The Fine "Network" of Motor Control

For the past three years, Nathaniel G. Pitts has been serving as a postdoctoral fellow in the neurophysiology laboratory of Professor Victor J. Wilson. He has also been serving as the delectation of Rockefeller tennis nuts.

Dr. Pitts's research interest is the role of the neural network called the reticular formation. As he explains, the reticular formation was previously thought to be primarily a center for the modulation of sensory input. Findings in Dr. Wilson's laboratory, mainly under the direction of Dr. Barry W. Peterson, indicate that the medullary reticular neurons also appear to be part of a major system of motor control.

Motor control is something Dr. Pitts knows a lot about, inside the lab and out. The combination of academic pursuits and a smashing backhand appears to be a family tradition. Dr. Pitts's father, who recently retired as dean of academic affairs of the California community college system, is a mathematician who taught for many years at the University of California and played tournament tennis. Young Nat got his first racket at the age of seven, became "serious" at 13, and during his high school years in Pasadena, trained with Pancho Segura in a group that included a youngster named Stan Smith.

At Whittier College, where he began his career rated as the most valuable freshman player, he soon found that the demands of the chemistry lab made severe inroads on his court time. Nevertheless, he continued to play when he could and to teach tennis, in college and in graduate school, both to supplement his income and to keep his father happy. One of his students became Mrs. Pitts, now a specialist in early childhood education and mixed doubles.

Dr. Pitts came to Rockefeller after

IN PRINT

Professor **Michael Cole**, Comparative Human Cognition, wrote the introduction to and edited a new volume, *Cognitive Development, Its Cultural and Social Foundations*, written by A.R. Lurii, translated by Martin Lopez-Morillas and Lynn Solotaroff, and published by the Harvard University Press. The book is available in the Rockefeller Library.

Professor **Douglas L. Medin**, Mathematical Psychology, is the editor of a new book, *Processes of Animal Memory*, published by Lawrence Erlbaum Associates and distributed by Halsted/Wiley. The volume contains expanded versions of papers presented at a conference at Augustana College, Rock Island, Illinois, in October 1974, including a chapter by Dr. Medin, titled "Animal Models and Memory Models," and one by Research Associate **Jesse W. Whitlow** titled "The Dynamics of Episodic Processing in Pavlovian Conditioning."

Vice President **Rodney W. Nichols** was one of six expert contributors to the volume, *Policy Analysis on Major Issues*, a compilation of papers prepared for the Commission on the Operation of the Senate published earlier this year by the U.S. Government Printing Office. Mr. Nichols's section was titled "R&D Outlook: Selected Issues on National Policies for Science and Technology."

THANK YOU NOTE

Frances Kralick, who retired on April 29 as supervisor of the University's X-ray service, has asked *news and notes* to thank all her many friends on campus for the "treasured" book of letters and mementos, "the best party ever," and "a most generous check," a part of which Mrs. Kralick has donated to Scout Troop 17 in Queens in the name of the Rockefeller University Friends.

earning his Ph.D. in physiology at the University of California at Davis. In addition to his lab work, he has participated in studies at the pain clinic at the Sloan-Kettering Cancer Center and has also been exploring the use of acupuncture in pain relief.

In August, Dr. Pitts will begin a new appointment as assistant program director for the Neurobiology Program of the National Science Foundation. It will be a sad day for campus hackers and York Avenue gawkers when Nat Pitts packs up his sneakers.

A Scientist Remembered

Professor Henry N. Wood of the laboratory of developmental biochemistry is one of the many talented amateur artists on campus who have exhibited in the University's periodic arts and crafts shows like the one scheduled for next fall. The charcoal sketch below, of Dr. Wayne Woolley, was done by Dr. Wood in 1962 and hangs on the wall behind his desk. It has a very special significance for him.

Woolley, a member of the scientific staff of The Rockefeller from 1939 until his death in 1966, was in Dr. Wood's view, "one of the most gifted and creative individuals I have ever met."

Among Woolley's achievements, Dr. Wood cites his pioneering use of microbes to isolate and characterize vitamins and growth factors. "When you look at the label on your vitamin bottle, you will see nicotinic and pantothenic acids and inositol, which he was in great part responsible for. His studies concerning the use of antimetabolites to trace unknown metabolic disorders in animals and man were his essential contribution and are brought together in his book, *A Study of Antimetabolites*. His later prophetic studies of serotonin and its receptor sites in relation to hypertension and mental illness paved the way for the study of psychosis on a biochemical basis."

Beyond his own scientific contributions, Woolley is also remembered for the devotion and support he gave to younger colleagues in whom he recognized what Dr. Wood calls "the spirit of creative research."

Wayne Woolley was blind throughout his working life. "Many times," says Dr. Wood, "as I have pondered a difficult problem, I have looked at his likeness there on my wall and asked how is it I have eyes and cannot see. In a situation like that, he's a good man to have behind you."

