

The Rockefeller University II: Designs on Behavioral Biology

Early this month the Rockefeller University and the New York Zoological Society announced creation of an Institute for Research in Animal Behavior, which they will jointly operate. To this alliance the zoological society brings its very large and varied collection of animals and its expertise in handling them, while the university brings its prowess in laboratory research in the life sciences. And the new institute will clearly be involved in research in the sector where many scientists expect a major "breakthrough"—behavioral biology.

Achievements in cell biology, biochemistry, neurophysiology, and molecular biology in recent years have revolutionized biology and opened vistas which appear to lead to the modification of human behavior through application of the achievements of biology. While the prospect is exciting, the peaks are only dimly discernible, and research is still in the foothills.

The announcement made jointly by the society and the university puts the matter circumspectly, saying that the basic purpose of the institute is "to carry out cooperative investigations on the behavior of living organisms, the influence of environment on behavior, and the relevance of animal to human behavior."

A display of interest in animal behavior signals no sharp departure for the university. The limited partnership with the zoological society represents another step in the planned development of Rockefeller, begun just over a decade ago when Detlev W. Bronk came there as president with the task of grafting an educational program for doctoral students onto a research institute with a distinguished record of research in medicine and the life sciences (*Science*, 24 December). The grand design called for the creation first of a graduate university in the natural sciences, and then for expansion into the relevant behavioral sciences and perhaps social sciences. At the university there seems to be a general feeling that a sound beginning has been

made and that the time is scientifically opportune for moving into phase two.

There are some historical precedents at Rockefeller which make it appropriate for the university to take the initiative in studying the interaction of physiological and psychological elements in the behavior of animals, including humans. Under its first director, Simon Flexner, the Rockefeller Institute pioneered in putting experimental biology on a physicochemical instead of a purely zoological basis. The institute, with its research hospital on the grounds, was also early in integrating laboratory and clinical research. In view of this background, and of the institute's having been a center of activity during the recent and continuing ferment in molecular biology, it is not surprising that many at the institute favor engagement in what they regard as the next big challenge. And, as one graduate student at Rockefeller put it, there seems to be a "desire in the biological sciences to get back to the whole animal."

In biology today, Rockefeller's scientific credit rating is pegged very high by the caliber of its faculty—men like Edward L. Tatum in biochemical genetics, Alfred E. Mirsky in cell biology, Theodosius Dobzhansky in evolutionary and population genetics, René J. Dubos in environmental medicine, Fritz Lipmann in biosynthesis, and many others.

Mirsky, a member of the Rockefeller from the mid-thirties and now both a full professor and librarian, expresses a feeling which is fairly common at the university when he says of behavioral biology, "It's an important part of biology that we've been missing," but goes on to say, "it's a question of whether the time is ripe."

It is generally recognized that a great leap forward can't be attained by administrative fiat. Several things, however, have been done to open the way. A year ago, appointment was announced of two vice presidents (Rockefeller has operated with a lean administrative staff), one a veteran member of the faculty, the other a newcomer.

The former, to be specifically concerned with the clinical sciences and their extension is Maclyn McCarty, a professor and physician-in-chief, who has been at Rockefeller since 1941. He is in charge of the university's 50-bed research hospital and generally oversees the university's "clinical section."

The other vice president and newly appointed faculty member is Carl Pfaffmann, whose special assignment will be to foster the development of the behavioral sciences. Pfaffmann, who moved to Rockefeller from the psychology department at Brown, describes himself as "a physiologist interested in psychology or vice-versa." In the thirties, as a graduate student in England, he worked with Lord Adrian, professor of physiology at Cambridge, and then in 1939 joined the University of Pennsylvania's Johnson Foundation, which was headed by Bronk.

A clue to Pfaffmann's attitude on segregation of disciplines may be gained from the fact that he was chairman of the National Research Council division of anthropology and psychology in 1962, when a decision was made to include sociologists, economists, and political scientists and to change the name to the division of behavioral sciences.

Pfaffmann sees the building of the behavioral sciences at Rockefeller as "a long-term process." It makes sense, he says, to start with what "articulates" with what is already being done at Rockefeller.

An example of work that may be undertaken is research aimed at building a bridge between the physiological and the psychological bases of understanding. Studies of the cognitive process and of communications theory would appear to be logical undertaking. A rapprochement between molecular biology and the behavioral sciences is also discussed as a possibility, but the problem of establishing, for example, the molecular basis of learning is treated as a very formidable one by Pfaffmann and others at Rockefeller.

The goal at the university would seem to be development of a situation in the behavioral sciences in which research would be carried on at the biological, psychological, and institutional levels, and in which researchers would, in the hackneyed academic phrase, "interact." For Rockefeller is a place, as Pfaffmann says, where cross-talk is possible.

The behavioral sciences are not, how-

ever, the only area in which the university is developing. More work—more graduate work in particular—is contemplated in physical chemistry, theoretical physics, and mathematics.

In line with Bronk's plan to expand along "natural lines," faculty in theoretical physics, mathematics, and philosophy were brought in soon after the conversion to formal graduate education was begun in the mid-1950's.

So far, few graduate students have gravitated to the physics and mathematics groups and none have chosen philosophy. But a number of young scholars in the postdoctoral phase have been attracted, and an expansion in the numbers both of regular faculty and of students in these sectors seems imminent.

In theoretical physics there are currently two main groups, one headed by George Uhlenbeck and E. G. D. Cohen, whose main interests, according to the catalog, are "centered around the statistical and kinetic approach to equilibrium of physical systems and the many phenomena connected with non-equilibrium and equilibrium processes."

The other group is led by theoretical high-energy physicist Abraham Pais. At first blush, since high-energy physics is high-cost physics because of the price of big machines, a high-energy physics group at a small university may seem a cuckoo in the nest. But Pais says "the notion of big machines attached to a university lab is obsolete." It is essential that theoretical physicists be in touch with a laboratory equipped with big machines, says Pais, but he spends 2 months in the summer at Brookhaven, and this and other contacts with the big AEC-financed national laboratory suffice.

As for the physicists being outnumbered at Rockefeller, Pais points out that they have the mathematicians to talk to, and that the New York metropolitan area is becoming a vigorous area for theoretical physics, and colleagues are accessible.

As for the relations with other scholars at Rockefeller, Pais notes that "there is very little in common between a lambda particle and a human cell." He finds the atmosphere and the people at Rockefeller congenial and considers this important. And he strongly approves of the Rockefeller system, which is designed to make graduate students "self-propelled," saying, "We hope to make a new generation of scientists."

Literally down the hall from the

physicists, at the top of the new laboratory-office building at Rockefeller, are the mathematicians and the chief of the mathematics "lab," Mark Kac.

Kac has maintained a lively interest in physics and worked as a consultant with Uhlenbeck at the Radiation Laboratory at Cambridge during World War II. He deplors an "isolationist tendency" in mathematics these days and says the only way to combat it is to "educate a generation of students" in physics, chemistry, and other fields, "and also to expose mathematicians to other ways of being clever." Kac says he is a believer in the theory of overlapping interests, and Rockefeller, where students in other fields come to the mathematicians for help and where the mathematicians are exposed to seminars in other subjects, seems a fine place to test the theory.

It is highly unlikely that Rockefeller will ever extend its academic spectrum far into the humanities. But philosophy, the progenitor of the sciences, was represented in the original expansion and seems to be assured a place. Under the first professor of philosophy, Ludwig Edelstein, who died last summer, the history and philosophy of science were given formal emphasis, but Edelstein's personal warmth and interests seem to have carried the influence of philosophy beyond the limits of seminars. Associate professor Harry G. Frankfurt, Rockefeller's lone philosopher on the faculty, currently is making a special effort to show how philosophical method may be helpful in scientific reasoning.

In the future, the question of expansion into the behavioral sciences and social sciences is likely to be answered in the same way that such questions are answered now, by reference to work already being done at the university. It will not, for example, be a case of asking whether history should be taught, but of deciding what kind of history. A safe assumption, however, is that in any expansion emphasis will be given to maintaining Rockefeller's big faculty-to-student ratio.

The behavioral sciences already figure prominently in at least two clinical studies headed by Rockefeller researchers. Vincent P. Dole is conducting a study of narcotics addiction and other forms of drug abuse. The research is focused on the metabolism of opiates in addicts. But it has become in many ways a study of the typical New York heroin addict, and a psychiatrist is an

important member of the research group.

Another project which relates to the work done at Rockefeller on metabolism, over the years, is a study on metabolic and behavioral interrelations in obese humans during weight reduction. Jules Hirsch, an M.D., runs the project, with the aid of other physicians, a biostatistician, and a psychiatrist.

It appears that, for some years, most clinical studies in the hospital were viewed as not in the mainstream of activity at Rockefeller. But projects in behavioral medicine are now drawing more interest.

Hints of things to come can probably be divined from several meetings and seminars held at the university in the recent past or scheduled for the future. In November, for example, Rockefeller and the State University of New York sponsored a symposium on "The Future of Biology" for biology faculty from New York's far-flung university system. The symposium, held at Rockefeller, had some of the elements of a pep rally for scholars and included a discussion of the future role of behavioral studies in biology.

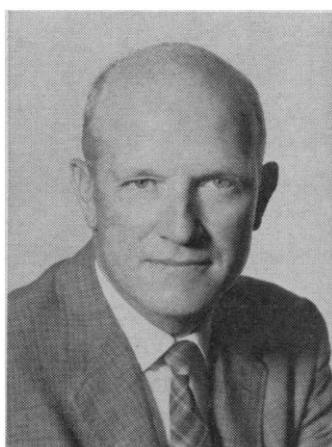
Earlier this month Rockefeller University, in collaboration with the Russell Sage Foundation, sponsored a meeting on "Biology and Behavior: Neurophysiology and Emotion," for scientists whose research combines "biological and psychosocial techniques."

Pfaffmann has announced a seminar for next term in physiological psychology on the biological basis of learning. Neal E. Miller of Yale will be a visiting lecturer during the spring and will lecture and chair discussions at several of the sessions. Some 60 students and faculty members have indicated interest in attending, a fair showing, since there are now just three graduate students in the behavioral sciences at Rockefeller.

The new Institute of Research and Animal Behavior breaks more than one precedent for Rockefeller. Not only will its establishment mean going into a limited partnership with another institution, but it will involve a departure from the Rockefeller pattern of the organization of research, which has been based on a sort of federation of laboratories, each with a leading scientist and his associates and students all working on roughly the same problem. The new institute is almost sure to grow larger than existing groups,



Maclyn McCarty



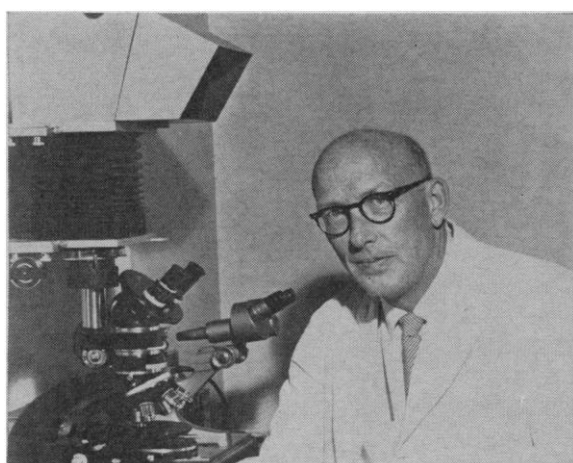
Carl Pfaffmann



Mark Kac



Donald Griffin



Edward L. Tatum



Theodosius Dobzhansky



Alfred E. Mirsky, Rockefeller professor and librarian, stands before a portrait of Lavoisier and his wife by David. This painting hangs in the university library.

and research is likely to diversify to such an extent that this pattern will not really serve.

Donald Griffin, former professor of zoology and chairman of the department of biology at Harvard, has moved to Rockefeller as professor and director of the new institute. Peter Marler, professor of zoology at the University of California, Berkeley, will assume a professorship at Rockefeller this summer. These are joint appointments to the institute and the university, and others are expected in the near future.

The barn of a disused demonstration farm at the zoological park will be converted for experimental work. Griffin is an authority on bird navigation and has done trail-blazing research on bats' use of a kind of sonar for flying in the dark and even catching insects on the wing. He hopes to have a dark-room constructed in the building, where more satisfactory studies can be made of the owl's method of locating its prey by listening for faint sounds. Griffin's interest in bat sonar could

lead to the study of in-flight behavior of bats in a wind tunnel, if engineering problems can be solved successfully. If a flying bat could be kept stationary by means of moving air, studies of in-flight behavior would be greatly simplified.

The institute will have access not only to animals at the Bronx Zoo but to those at the society's aquarium at Coney Island and at a laboratory of tropical biology in Trinidad.

The public is being assured that the agreement does not mean that animals will be transferred from zoo cages to the laboratory. Rather, laboratory scientists will have access to a greater variety of animals, some to be collected on zoological society expeditions, and will also have help and advice from people with experience in caring for animals. (The society also has its own researchers, who will work in the institute.) Perhaps most important, it is hoped that scientists interested in the behavior of animals will have a better chance to observe them in a state which

approaches the natural one. For it is agreed that the behavior of an animal under laboratory conditions may be quite different from its actions in nature. In studies of the behavior of animals or humans, it is important that circumstances be as near normal as possible.

The institute and the whole new venture into behavioral biology at Rockefeller are, as one faculty member said, only in the embryonic stage. Some other institutions are, as a matter of fact, substantially ahead of Rockefeller in this field. Rockefeller University, however, has impressive resources and a policy which, when followed, leaves researchers few excuses, since it approximates most scientists' own prescription for the ideal in science administration. That policy, as Bronk said at the lunch announcing establishment of the institute, is to "choose people who desperately want to do what you desperately want done, back them up, stay out of their way."

—JOHN WALSH

Education: New Commissioner Champions Change and Reform

The appointment of Harold Howe, II, as U.S. Commissioner of Education by President Johnson on 18 December is one of two major changes affecting the development and execution of federal education programs. The second change is that Francis Keppel, who has been commissioner since 1962, will be able to devote his full time to his duties as Assistant Secretary (for education) of the Department of Health, Education, and Welfare (HEW), a new position to which he was appointed in September.

Keppel once observed that the federal government increasingly should act as a "stimulator and supporter of ideas and innovations which appear to contain potential for improving the quality of education." Howe, who will succeed Keppel by 1 February, has been, above all, an experimenter in education and appears well fitted to lead the kind of innovative effort of which Keppel spoke. He was the personal choice of Keppel and John W. Gardner, who as

president of the Carnegie Corporation—and an exponent of educational reform—had known Howe before becoming Secretary of HEW last August.

As assistant secretary, Keppel will be Gardner's principal adviser on education policy; however, Howe will not report to him but will go directly to Gardner. Keppel will coordinate HEW's education programs with those of other federal departments and agencies and, once relieved of the commissionership, will devote his time increasingly to his duties as chairman of the Interagency Committee on Education.* The importance of the committee, which was established in late 1964, probably will depend upon Keppel's effectiveness as chairman, together with the degree of interest Gardner and the President take in its recommendations.

The committee could become a major source of new ideas and policies, not only for education programs but for other programs in which education plays a part. Spending obligations by

the federal government for education and related activities during the current fiscal year are estimated at \$8.7 billion, of which Office of Education programs will account for \$3.1 billion.

Spending by the Defense Department for these purposes is expected to total \$1.8 billion; spending by the Public Health Service (which includes the National Institutes of Health), \$1 billion; and spending by the Office of Economic Opportunity (the antipoverty program), \$708 million. Each of a number of other agencies, such as the National Science Foundation, the National Aeronautics and Space Administration, the Housing and Home Finance Agency, and the Labor Department, will spend between \$100 million and

* In addition to Keppel, committee members are Charles Frankel, Assistant Secretary of State for Educational and Cultural Affairs; Lynn M. Bartlett, Deputy Assistant Secretary of Defense (Education); George L. Mehren, Assistant Secretary of Agriculture; Philip Arnold, Deputy Assistant Secretary for Policy Planning and Research, Labor Department; Henry W. Riecken, Associate Director, National Science Foundation; John G. Palfrey, Commissioner, Atomic Energy Commission; Willis H. Shapley, Associate Deputy Administrator, National Aeronautics and Space Administration. Observers are William D. Carey, Executive Assistant Director, Bureau of the Budget; Benjamin Okner, staff economist, Council of Economic Advisors; Charles V. Kidd, Executive Secretary, Federal Council for Science and Technology, Office of Science and Technology; Ernest M. Allen, Grants Policies Officer, Public Health Service, National Institutes of Health; Lisle C. Carter, Assistant Director of Interagency Relations, Office of Economic Opportunity; Charles Blitzer, director, Division of Education and Training, Smithsonian.