Neuroscientists Look for Theories

A place to think and work, unencumbered by the bureaucracy of research grant applications—that is the aim of the new Neurosciences Institute in New York

Rockefeller University, New York, is host to a new and unusual body, the Neurosciences Institute (NSI). The institute, which has no laboratory facilities, is meant to be a cauldron of radical ideas on one of the toughest of intellectual challenges, that of how the human brain works. An important element in promoting adventurous approaches to the problem is the fact that work there will be financed almost entirely from private funds, administered by the Neurosciences Research Foundation (NRF).

Neuroscience is one of the most vigorous areas of current biological research, a fact reflected among other things in the escalating attendance at the Society for Neuroscience's annual meetings. "There has been a tremendous explosion of data over the past decade or so," says Maxwell Cowan, chairman of the Scientific Advisory Committee to the Neurosciences Institute, "but there is a surprising absence of theory to bring it all together." The NSI is to focus on this deficiency in theoretical framework, particularly in reference to higher functions such as perception, learning and memory, and thought and emotions.

The NSI is the newest manifestation of the Neurosciences Research Program (NRP), which was established by Francis Schmitt in 1962. "The term 'neuroscience' hadn't even been coined at that time," says Cowan, who works at the Salk Institute, "and the whole field was extremely fragmented." The foundation of the NRP, a small group of 36 elected members serving 9-year terms, together with the formation of the Society for Neuroscience in the late 1960's, helped to create a sense of unity in a previously disparate field of research.

By the late 1970's NRP members began to question the direction of their efforts. "We set up an informal panel," says Vernon Mountcastle, the program's current director and professor of neuroscience at The Johns Hopkins University, "and one result was to create the Neurosciences Institute." Panel members acknowledged the tremendous success in applying cellular and molecular techniques, but concluded that a new initiative was required to reach an understanding of higher functions.

Gerald Edelman, who was one of the chief proponents of the NSI and is now its director, sees the institute as "a place where people can rattle around together and play with ideas unconstrained by the usual bureaucracy of research." In its current temporary quarters the NSI can accommodate around six researchers, but this number will rise to about 15 with the move to its permanent site in the fall.

"Use of the institute will be very flexible," says Edelman. "A small group of people might want to get together on a very specific problem for just a couple of days. Someone might want to spend as much as 6 months here, arranging mini-conferences from time to time. Sometimes a monograph will be the prime aim of a project, while at others the idea will be to formulate experiments which will then be carried out elsewhere." Edelman hopes that one great attraction will be unmatched library facilities and access to computer databases.

A number of projects are already under way. One meeting, for instance, tried to outline the problems involved in recording from the brain using multiple electrodes. Mountcastle, who with David Hubel and Torsten Weisel of Harvard made single-electrode recording an extremely powerful analytical tool, predicts that multiple recording will mark a move to big science for neurobiology. "With an array of, say, 200 implanted electrodes, there would be a vast flow of information that would require a new generation of handling facilities," says Mountcastle. "The problem of complexity and scale are staggering, but they must be overcome if we are to achieve this next big step in analysis of brain function."

Among several other projects at NSI, Pasko Rakic of Yale has one in embryo to do with development in the nervous system, the way connections are established. "A lot of people are doing very good work in development," says Rakic, "but results in one area are not interpreted in light of results in others."

Together with Dale Purves of Washington University, Nicholas Spitzer of the University of California at San Diego, and Stephen Easter, of the University of Michigan, Rakic has formed a core group of expertise in development in the central and peripheral nervous systems, in invertebrates, and in eye-brain connections. At intervals of 2 to 3 months, starting in August, Rakic and his colleagues will meet at the NSI with four or five experts in one of these areas for a short intensive session. "Our hope is to look for common characteristics in these four areas of development," says Rakic, "so we can perhaps pull together some general theory."

Rakic is enthusiastic about the NSI because of its free format. Conventional funding constrains the way meetings and projects are carried out, suggests Rakic. "When you apply for government funds you have to conform to their mold," he says, "and everything is the same. People talk about work they've already done. We want to discuss new ideas and the future, and for normal grant applications you can't do this."

In addition to the potpourri of projects at the Rockefeller site, the NSI will hold an annual meeting at the Salk Institute. The meetings will be on what Cowan terms "hot topics." The first, in October, is to focus on the cerebral cortex, says Cowan, while the application of molecular biology and monoclonal antibodies are future possibilities.

The establishment of the NSI at the Rockefeller University is to be followed by the transfer to New York of the Neurosciences Research Program from its previous home at the Massachusetts Institute of Technology. And the Neurosciences Research Foundation, whose umbrella covers both the institute and the program, has become a "publicly supported, not-for-profit organization" headed by William Golden. The NRF's reserves, donated by private individuals and foundations, currently stand at $3 million. Golden hopes to treble this figure so as to provide sufficient investment income to support the NSI's and other activities. The NSI's initial annual budget is close to $250,000.

The NRP, with its small elected membership, has been perceived both from within and without as somewhat elitist, a matter of some sensitivity in the field. Both Edelman and Cowan stress that the NSI is in the business of succoring good adventurous ideas, wherever they come from. "We see the NSI as an opportunity to advance the field in a way that cannot be achieved in the day-to-day activities of normal laboratory work," says Cowan.—ROGER LEWIN

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