Learning and the Human Sciences

Chairman's Symposium: Human Learning Capacity in Neurobiological Perspective

One of the central offerings of this year's meeting will be a 2-day symposium on changes in concepts of human learning derived from studies across an increasingly wide front in the neurosciences. The symposium, "Human Learning Capacity in Neurobiological Perspective," is being developed under the chairmanship of S. Dillon Ripley, secretary of the Smithsonian Institution, by Philip Ritterbush, associate editor for the Washington Meeting.

While the topic was chosen primarily for scientific breadth and timeliness, it also reflects Ripley's belief that museums have more to offer the educational process than is usually conceded. From the museum's standpoint colorful arrays of objects beckon invitingly—promising to involve the viewer and reward curiosity with authentic experience—and so lead on to knowledge. Schools on the other hand tend to emphasize formal verbal skills which can be acquired in the classroom and have shown little interest in different styles of learning. This symposium will explore some of the revolutionary changes taking place in concepts of learning as understood by neurobiologists, primarily as a review of a scientific field, but with a secondary aim of suggesting concepts of learning broader than those now governing educational practice.

The symposium will begin with the first Special Lecture of the meeting, by Jerome Kagan, professor of social relations at Harvard University, on "Cross Cultural Perspectives on Early Development," summarizing studies of the cognitive growth of children in rural and town settings in Guatemala. In those communities very young children initially appear to be retarded by a depauperate home environment, but later achieve parity with others raised in more stimulating settings, which suggests that the disadvantages of sensory deprivation may be overcome as an innate and highly plastic capacity for learning develops. Measurements of children's capacities for recall of objects, recognition memory of images, and even conceptual inference, indicate that these functions develop well in rural Guatemala without formal schooling. Thus learning behaviors in the natural environment bear direct relevance to education.

The symposium will explore similar themes in four sessions on 28 and 29 December. The first session will chart physiological substrates related to learning: cellular architecture, neural mechanisms, the chemistry of transmitters, and neuroendocrinology. The aim in this initial part of the program will be to provide a restatement of research on fundamental aspects of brain function which seem likely to have a future bearing on the education of cognitive behavior. One of the papers will be given by Mark Rosenzweig of the University of California at Berkeley on brain plasticity in response to environmental enrichment.

The second session will be in a series of reports on neuroethology. One of the papers will be given by Peter Marler of the Rockefeller University on genetic constraints on learning with particular reference to the effects of isolation and deafness on the capacities of various bird species to learn their characteristic songs. He will challenge the appropriateness of the commonly drawn distinction between innate and noninnate behavior.

The third session will be devoted to the biological basis of the capacity for communicative behavior and the acquisition of language. Peter Reynolds of the Stanford VA Hospital will discuss play and hominization. Ursula Bellugi of the Salk Institute will recount studies of sign language, concentrating on how deaf children learn from deaf parents. Contrary to earlier belief, sign language does not lack inflections and grammar. The process of learning its rich surface structure is visually mediated, which widens the number of techniques that can be employed in investigating this mode of human learning.

The final session of the symposium will treat human learning in relation to environmental design. Richard Chase of Johns Hopkins University will consider ways in which environmental design may be expected to release human behavioral potential, based upon a review of findings about learning environments, play, and child development. The concluding paper of the symposium, by Roger Sperry of the California Institute of Technology, will be "An Emergent Theory of Mind and Some Implications for the Social Role of Science." As the brain process comes to be understood objectively, all mental phenomena, including the generation of values, can be treated in principle as causal agents in human decision-making. The old dichotomy between science and values is thus open to challenge, and problems of human values, so central to the enterprise of education, may be exposed to powerful techniques of investigation.

The concluding session of this symposium promises to cast light on value aspects of contemporary scientific thought, following logically in the same day after another program (on the morning of the 29th) "Science and the New Challenges to Rationality," being arranged by Gerald Holton of Harvard University. Another related program, on the 28th and the morning of the 29th, cosponsored by Section I of the AAAS and the Society for Research in Child Development, will be "Sex Role Learning in Childhood and Adolescence," arranged by Dale B. Harris of Pennsylvania State University. This program will examine how sex roles come into being in our culture, placing greater stress on socialization than the chairman's symposium.

Sex Role Learning in Childhood and Adolescence

At a time when people of all ages and groups are questioning traditions and traditional roles it is all the more important to examine our best evidence concerning sex differences, their contributions to social roles, and the patterning of roles through social and learning processes. Feminists who wish to assert new alternative roles must know how these may be brought about. Clinical psychologists who make be-

havioral decisions concerning personal adjustment must understand these role patterning processes.

Social scientists who will be asked to make statements on "crimes without victims" must have some theory and evidence for their assertions. Schools and institutions where the caretakers of children are predominantly women are being questioned with ever more critical intensity.

The revived woman's movement has raised issues that the social sciences nave ignored, or neglected, by failure to integrate various and diverse findings on sex differences and similarities across research investigations on a wide range of problems. This revived movement may be creating myths about social roles just as erroneous and confusing as those which it seeks to discredit. The symposium's crucial task is to extricate scientific fact from wishful fancy concerning the behavioral attributes of structural sex differences and how both are, covertly and more grossly, reinforced and bent to social ends.

John Money will argue that, while prenatal hormone levels influence in degree subsequent manifestations of some sexually dimorphic behavioral characteristics, the greater part of gender identity arises postnatally in response to social interaction. Ben Rosenberg will critically examine the use of simplistic models inherited from biology. Walter Emmerich will look more closely at some of the methodological pitfalls in research.

Eleanor Maccoby will examine evidence for differential parental treatment of boys and girls to discover how these relate to the learning of consistent behavioral differences between the two sexes. David Lynn, from his taxonomy of identification types will examine how both blatant and subtle differences in intrafamilial treatment influences intellectual differences between boys and girls. Aletha Stein will examine much the same phenomena in relation to the significant personality dimension of achievement motivation.

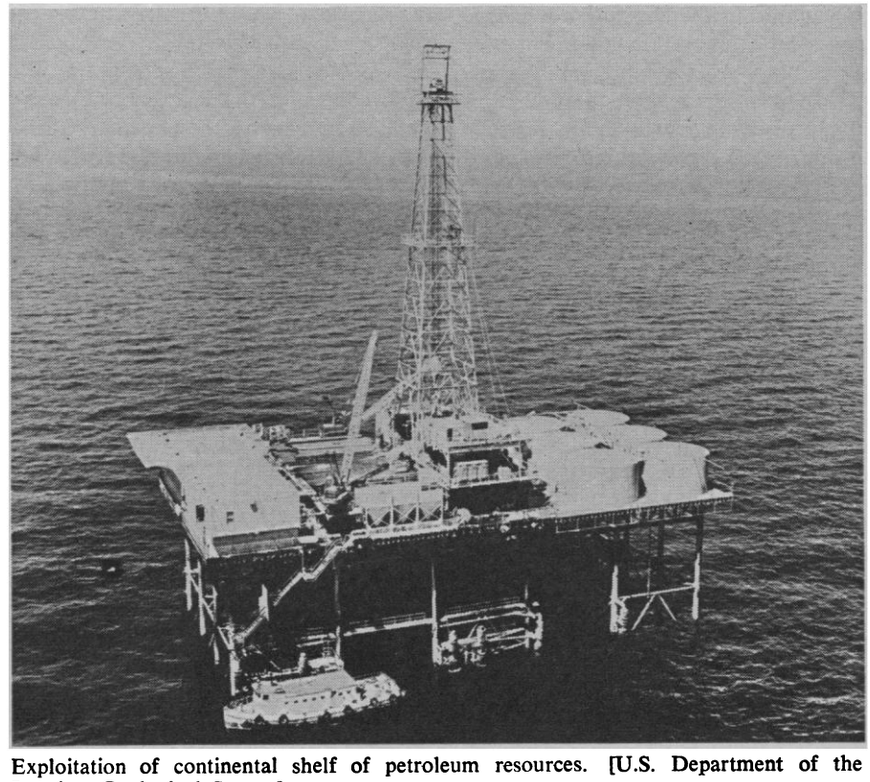
Julia Sherman will address questions about the distinctness of the goals of femininity from that of competence. Henry Biller will seek to sum up selected issues from a multidisciplinary approach. Jessie Bernard will conclude by raising a very fundamental and disturbing question. Is research into the origins of sex differences a "cop-out" whereby we avoid seeking remedies for discrimination?

International Science and Technology

The first in a number of programs about international aspects of science and technology will be held at the Department of State on 27 December in its auditorium. The symposium will deal with the participation of scientists, scientific organizations, and government agencies in the formulation and implementation of oceans policy. The arranger for the program will be Dr. Grant Hilliker of Ohio State University, a former Foreign Service Officer with extensive experience in the State Department's use of computer technology and specialized technical knowledge. The program is being cosponsored by the Bureau of International Scientific and Technological Affairs, which has arranged for participation by a number of cognizant offices within the department. This will be one of a number of policy programs whose aim is to provide case studies, in some detail, of how policy is made and applied, with particular attention to the role of scientific and technical knowledge, policy analysts, and the professions.

On 28 December, the AAAS Section on Agriculture will sponsor a half-day symposium on organizational arrangements ofr international commodity research. The International Rice Research Institute was established to concentrate research on a single commodity in a single center with the best talent available in the world. A second generation of centers is now being sponsored by the World Donor Group, with a somewhat different approach to geographical concentration, outreach, and institutional cooperation. This program is aimed at widening the dialog within the U.S. scientific community about the operational philosophy of these important new centers.

On 29 December, Dr. Arthur K. Solomon of Harvard University will arrange a day-long symposium on the role of science in the United Nations system. Participants will either be managers of U.N. scientific and technical programs or outside observers and critics who have made them a matter of particular study. Topics to be covered will include a discussion of the use of science within the U.N. system, International Geophysical Year, the International Institute for Theoretical Physics, and Unesco. Among those expected to participate as discussants are Herman Pollack, Harrison Brown, Eugene Skolnikoff, and Roger Revelle.



Exploitation of continental shelf of petroleum resources. [U.S. Department of the Interior, Geological Survey]