Meetings

Ethology and Experimental Psychology

Informal exchange of information and viewpoints among ethologists and experimental psychologists was the goal of an international conference held at the Istituto Superiore di Sanità in Rome, 15–20 June 1964, under the sponsorship of the National Institutes of Health.

Among the topics discussed in some depth was one that seemed particularly appealing to the ethologists, namely, "proximate" as opposed to "ultimate" causes of behavior. In general, the ethologists at the meeting stressed ultimate causes, with evolutionary principles supplying the ultimacy. Thus, when asking why an animal behaves in a particular way in a particular situation, the ethologists averred their tendency to seek answers in principles of selection, survival, and evolution. The American group felt rather that from those factors there emerges only the raw material of behavioral science (that is, the organism as it is), and that explanatory principles are to be sought in presently acting variables. From the latter point of view, the organism's constitution, physical makeup, genotype, and "wiring" all seem to define parameters of those behavioral functions with which American learning theory has been characteristically concerned for over three decades. Contemporary polemics on behalf of the genetic determination of behavior were pointedly described by one experimental psychologist as "honoring a variable." While it was plain to all that there was no fundamental disagreement between these two approaches to behavior, it was equally plain that, in preferences between the two points of view and in judgments regarding their value for behavioral research, the experimental psychologists and the ethologists were sharply divided and were likely to remain so for some time. This was puzzling and frustrating to the discussants in view of the disposition of experimental psychologists to think in zoological terms about organisms dealt with in modern learning theories, and in view of the growing readiness of ethologists to use controlled laboratory methods for the analysis of whatever aspects of behavior they select for study. It seems certain that future writings by conference members will be influenced by this recognition of the intransigence of the two groups with respect to theory, in the face of convergence with respect to research methods.

Related to the foregoing topic were the exchanges among participants on the issue of "natural or innate or instinctive" as opposed to "acquired or learned or modified" behavior. Difficulties of defining terms were readily admitted, as were the well-worn arguments harking back to the mid-19th century. But despite the sophistication regarding the older, and admittedly crude, categories of "heredity" and "environment," once again attitudinal differences toward the issue itself seemed to underlie the differences among conferees' research emphases. The relatively greater concern of the ethologists with species-genetic factors as behavioral determinants seemed to be a main source of their preference for observations of animals in the wild rather than the controlled conditions of a space like a "Skinner box" or a Pavlovian laboratory. Contrasted with this was the feeling of experimental psychologists that, while observations of animals "in nature" might provide general familiarity with the behavior spectrum of the species under study, the problems, once identified, needed to be brought under controlled laboratory scrutiny. They argued that the laboratory is more "natural," and less distorted, than nature itself and that what is "out there" is really quite chaotic. When the ethologists replied that the interactions of variables were crucial, and that the animal in its natural setting could best display the interesting and important (for species survival) interactions, the experimental psychologists retorted that the first analysis of a set of variables into main effects might well be followed by analysis of the interactions, but again under controlled conditions. The divergence between the two groups was clear, but it was not being satisfactorily rationalized. Several members suggested that the difference was one of *working* preference rather than of philosophy, and that such differences were to be expected since scientists are people after all. But some discussants were not prepared to dismiss the matter this way because it seemed to them that an important selective factor was at work to separate scientists of the two persuasions, since the difference in attitude was persisting even though the history and shadings of the controversy were so well known to all.

Some discussion took place regarding ethological theory, a topic of preoccupying weight to some of the American participants whose own research is centered on learning theory. Theory in modern ethology exists at both the intraspecies and interspecies levels to a degree not generally appreciated by the American participants. It has not as yet developed along the lines typical of learning theory, nor has it as yet shown quite so much concern with metatheory. The use of experiments or guided observations for the testing of theory is not as characteristic of ethology as is the descriptive categorization of behavior and the segregation through experiment and field study of causative variables. Ethological theory today is developing neurological and biochemical sectors of solid empirical character, in contrast with its earlier largely verbal and conceptual physiologizing about the bodily sources of behavior. This development was regarded by most conferees as encouraging, not only in itself but also because it may be a new basis for rapport between ethology and physiological psychology. On their side, the ethological members evidenced keen interest in American learning theory, particularly reinforcement theory, as well as a substantial acquaintance with it. Reinforcement itself came under examination,

with some ethologists expressing the feeling that the concept was a weak one, circular in definition and *ad hoc* in application. Replies to these arguments did not seem to convince. At times, this discussion seemed to veer from the problem of defining reinforcement to that of the theory and nature of reinforcement, and, at other times, to considering reinforcement as a construct, as an experimental operation, or simply as a mistake! There seemed to be hidden in this theme a number of deep-lying differences in conceptual approach to behavior theory, its structure, function, substance, and ends. What the opposing ethologists were urging as reasons for discarding reinforcement theory, the active Americans took merely as reasons for improving the theory.

A topic historically of high interest to ethology is that of the initiation of behavior. The more frequent focus of attention is on the cue, or trigger, or "releaser," of a behavior pattern or sequence, rather than on why or how a particular response is made to any specific cue (as if in some way, the response is more *given*; as if it were more a forced consequence of the cue than a matter of the cue being a forced antecedent of the response). The well-known use by ethologists of models in studying behavioral releasers has been extended to actually scaling the values or effectiveness of releasers, the general method being that of pitting cues against each other, following procedures akin to those of psychophysics and psychometrics. Ethology regards motivation as closely related to the problem of releasing mechanisms, and deals with motivation more as learning theorists do with "incentives," rather than as a state variable or as a parameter of behavioral functions. Because some of the American members were familiar with the scaling of incentives, general issues about scaling procedures provided a basis for active discussion among a subgroup of conferees.

One full day was devoted to subgroup meetings, at which three ethologists, acting as representatives for their discipline, illustrated their mode of approach to selected empirical and theoretical problems by outlining specific current research in their own laboratories. Three of the American experimental psychologists made similar presentations in subgroups to their European colleagues. The three ethological themes were:

1) studies of interacting and mutually modifying response patterns in the agonistic behavior of certain bird species;

2) an analysis of some functions, including generalization gradients, of releasing stimuli; and,

3) experiments on the relative importance as response determiners of various stimulus parameters in the egg-directed behavior of certain bird species.

The three experimental psychology themes were:

1) the general perspectives that inform most modern learning theories, and the basic categories of observation and fact that those theories try to handle;

2) the place in learning theory of the distinction between learning and performance variables, and the new importance of "incentive" in some current learning theories; and,

3) the historical development of experimental research and theory on anxiety, escape, and avoidance behavior, and a re-examination of the older formulations in the light of recent discoveries.

These presentations, and the discussions they evoked, were regarded by all conferees as having been very stimulating, and it was widely regretted that they came on the last day of the conference when the imminent dispersal of participants prevented more extensive follow-up.

Other topics touched upon during the week's discussions included units of behavior, the nature and definition of "stimulus" and "response," critical periods and imprinting, the relation of classical conditioning to imprinting, and human neonate behavior and early experience.

The organization of the conference was made flexible in order to enable the participants to pursue whatever subjects of interest emerged during the discussions. The smallness of the conference made it possible for conferees to meet in a body whenever the whole group expressed interest in a single topic or to divide into smaller groups to discuss topics of individual interest.

At the close of the conference, all participants agreed that it had been a worthwhile enterprise. In particular, the informality of the conference, the absence of set papers, and the ease of making personal contacts were felt to have been especially valuable. Hopes were expressed that a basis had been laid for future interaction among participants, possibly through prepublication exchanges of papers for comment and criticism and through exchanges of pre- and postdoctoral students.

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WILLIAM N. SCHOENFELD
Department of Psychology, Columbia University, New York 27, New York
SEYMOUR H. BARON
Division of Research Grants, National Institutes of Health, Bethesda, Maryland

Protoplasts and L-Forms

That bacteria undergo changes to L-forms as well as to protoplasts in vivo has stimulated much research. Impetus has been furnished especially by the establishment of similar organisms (Pleuropneumonia-like organisms, PPLO) as the Eaton agent, which causes primary atypical pneumonia in man. Elucidation of the nature of the Eaton agent, now known to be *Mycoplasma pneumoniae* instead of a virus, led to the study of the possible pathogenetic significance of such organisms in a variety of unsolved medical mysteries. Such organisms require special procedures for isolation and identification. L-forms, protoplasts, and Mycoplasma (PPLO) differ from bacteria in that they lack a rigid cell wall and pass through filters. By this latter characteristic they are similar to viruses. However, they are separable from viruses by growth on cell-free media and reproductive cycle. Relationships of L-forms and protoplasts to their parent bacteria in classical forms are becoming understood. Thus "mycoplasmology" is emerging as a specialty in itself; at the meeting of the American Society for Microbiology, 3–7 May 1964, in Washington, D.C., sessions were organized on this subject for the first time.

Protoplasts and L-forms were discussed at an invited session. Assigned papers on current significant contributions were followed by panel discussion.

The chemical and physical basis of