Drugs and Behavior

The Behavioral Pharmacology Society, an organization of psychologists and pharmacologists interested in advancing behavioral pharmacology as a scientific discipline, met at Columbia University on 19 January to discuss behavior and the effects of drugs on behavior. The direction taken by the papers and informal discussions makes it clear that progress in behavioral pharmacology can only be achieved by accelerating progress in behavioral science itself.

Useful estimates of relative potency among drugs can sometimes be obtained by administering multiple doses of a drug within a single experimental session. Ordinarily, to compare five different dose levels of five drugs would require 25 experimental sessions. However, administering cumulative doses during a single session reduces this requirement to only five sessions, and for many drugs this technique yields relative potencies that do not appear to be radically different from those obtained by conventional methods (Harley Hanson, Merck Institute for Therapeutic Research). A series of experiments on the comparative effects of methamphetamine and methylphenidate showed that both drugs increased shock avoidance response rate in *Macaca mulatta* and decreased the response rate for food reinforcements on a fixed-ratio schedule when the two schedules were part of a multiple schedule. Further studies with a variety of other reinforcement schedules also showed that these drugs reduced response rate when food rewards were used. These data conflict with other data in the literature, but mainly in the cases where rats were the subjects (Dom Finocchio, Ciba, Inc.).

The interactions resulting from variation in single components of multiple reinforcement schedules were described by Marcus Waller (University of North Carolina). On multiple fixed-interval, fixed-ratio schedules with pigeons as subjects, high ratio requirements may cause two different response rates within a single ratio run. Chlorpromazine produces, in this instance, a single intermediate rate, however, it also eliminates the temporally correlated characteristics of fixed interval behavior. Hypotheses accounting for avoidance behavior in the absence of a warning signal (Sidman avoidance) were presented by Douglas Anger (Upjohn Co.), who proposed that condi-

tioned aversive temporal stimuli play an important role in such behavior. The aversiveness of these stimuli fall to a minimum directly after an avoidance response and then rise as the occasion for the next shock approaches.

John Nevin (Columbia University) described experiments conducted in collaboration with Robert Berryman and William Cumming on matching-to-sample behavior in the pigeon. Several procedural variations were described, and some data on the effects of pentobarbital on delayed matching behavior were presented.

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Manpower Problems: Training of Mathematicians

A conference on "Manpower Problems in the Training of Mathematicians" was held in Washington on 16–17 April under the auspices of the Conference Board of the Mathematical Sciences (CBMS) with support from the National Science Foundation. It was held in response to a report on *Graduate Training in Engineering, Mathematics, and Physical Sciences* (EMP) prepared by the Gilliland Panel of the President's Science Advisory Committee and issued by the White House, 12 December 1962. The panel summarized the national requirements for EMP scientists at the Ph.D. level and considered various factors affecting the supply. The report concluded that the supply of graduate students could result in the production of 7500 doctorates in 1970, as compared with 3000 in 1960. In mathematics the report presented two alternative goals for 1970: 2200 or 1320, which are increases by factors 7 and 4, respectively, over the output of 303 Ph.D.'s in 1960.

The conference received detailed information on the supply of graduate students, the existing means for their support, and the currently available supply of mathematicians for their training from representatives of government agencies, the constituent organizations of CBMS, and the National Research Council. The effects of industry and of the proposed increase in the training program in engineering and physical