odological control and the strict experimental procedures that Kuo insists upon?

Kuo's book postulates two "new" theories, the theory of behavioral gradients and the theory of behavioral potentials. The theory of behavioral gradients maintains, in effect, that the organism responds as a whole unit in all behavior it exhibits; there are no local reactions. There are only visible and invisible portions of a reaction, labeled by Kuo as explicit and implicit gradients. There is no difference in importance between explicit and implicit gradients; both contribute equally to the total behavior pattern. Again, it would seem that to consider this position as valid in its extreme would lead to chaos, despite the fact that there are undoubtedly many contributors to a behavioral reaction that are not obvious or easily assessed. The theory of behavioral potentials is subtitled a new solution to the problem of the nature-nurture relationship. Behavioral potentials are "the enormous possibilities or potentiality of behavior patterns that each neonate possesses within the limits or range of the normal morphological structure of its species." Kuo contends that one of the major tasks of the behavioral epigeneticist is to strive to create new behavioral phenotypes by manipulation of the environment, with the only limitation being the behavioral potential of the organism. Creating behavioral neophenotypes will somehow make it possible to control the evolution of the organism in the future "independent of somatic changes and, therefore, without any need for changes in genotypes." How such a process might operate seems quite mystical, and I am unable to comprehend the author's conceptualization of how evolution works.

In developing his position on behavioral potential Kuo does, however, raise one important concept which is largely ignored in modern experimentation, and that is the concept of the importance of the environmental context as a determinant of the behavior observed. This is a point to which many give lip service but which few seriously consider. We seem to be content to allow our experiments and our results to be situation-bound, accepting the fact that our phenomena depend to an unknown degree on the experimental situation being studied. Indeed, experimental procedures dictate that we keep all other things constant in our manipulations of one or a few experimental variables. The outcome of this position is, curiously enough, that a well-controlled experiment has less generalizability than does a sloppy one in which all other things are not held constant. Kuo's position seems somewhat different from my own, but the emphasis he places on environmental context is an aspect of his argument with which I heartily agree.

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Glacial Drift

Einführung in die Geschiebeforschung. KURT HUCKE. Edited and enlarged by EHRHARD VOIGT. Nederlandse Geologische Vereniging, Odenzaal, 1967. 132 pp., illus.; 50 plates. D.M. 15.

The Quaternary Period of northwestern Europe is distinguished by glaciers which radiated from the Scandinavian shield and advanced across the Netherlands and the North Sea into eastern Great Britain and across the Baltic to cover large parts of northern Germany, Poland, and northern U.S.S.R. The geology in many parts of northwestern Europe reflects these conditions; the principal Quaternary deposits are stratified and nonstratified glacial and interglacial sediments including many gravels and boulders. Kurt Hucke undertook a long and searching examination of the rocks in such sediments from many parts of northwestern Europe so as to analyze their lithologies and fossils. Much of the present book, an interesting compendium on these rocks and their geologic origin, was in manuscript form at the time of Hucke's death in 1963, and the task of completing the study was undertaken by Ehrhard Voigt of the Hamburg Geologische Staatsinstitut, who greatly enlarged the original manuscript. The book is introduced with a memorial to Hucke by his colleague W. F. Anderson, who aided in its publication.

The book contains useful introductory sections discussing *Geschiebe,* which in this report includes the gravel-sized material transported as part of the bed load of a stream or by ice, or both, techniques and work methods for studying the gravels, and the geological framework of northwestern Europe. The principal part is a detailed chronostratigraphic account, divided into periods, of the lithologies and fossils of the gravels, starting with the Precambrian and extending to the Quaternary. This knowledgeable account brings together information about many aspects of the stratigraphy of northwestern Europe. This information is effectively summarized in tables of stratigraphic correlation for each period which will be an excellent aid for those not thoroughly versed in the stratigraphic terminology of northwestern Europe. The text is well illustrated with geologic maps and 24 halftones of lithologic types, handsomely complemented by 50 photographic plates of fossils, arranged stratigraphically, which constitute a handy atlas of fossils. The extensive bibliography and careful index greatly enhance the study. Geologists will find this book provides a valuable compilation of lithologic types and fossils from northwestern Europe.

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Reactions

Chemical Kinetics. G. PANNETIER and P. SOUCHAY. Translated from the French edition (Paris, 1964) by H. D. Gesser and H. H. Emond. Elsevier, New York, 1967. xvi + 455 pp., illus. $17.

This book is clearly written, at a level appropriate for students taking a first course in reaction kinetics. It has an unusually wide coverage of all kinds of reactions. The first 296 pages deal with homogeneous reactions and the next 125 with a wide variety of heterogeneous processes. An interesting list of not-too-difficult problems will challenge the serious student. There is wide and satisfactory coverage of the methods and instruments used in the measurement of reaction rates. The authors make no use of statistical mechanics. For example, partition functions and quantum mechanics are not mentioned, although interesting three-dimensional potential energy surfaces for a number of reactions are given. Absolute reaction-rate theory is formulated only in its thermodynamic form, and collision theory is derived with the use of kinetic theory. This book is a useful beginning text in chemical kinetics but should be followed by a more advanced course for physical chemists.

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