Book Reviews

Philosophy of mathematics and natural sciences. Hermann Weyl. Princeton, N. J.: Princeton Univ. Press, 1949. Pp. x + 311. $5.00.

Philosophers of science have long admired Weyl's "Philosophie der Mathematik und Naturwissenschaft," which appeared in Oldenbourg's *Handbuch der Philosophie* in 1927; they have also regretted its unavailability. The present volume is in part a translation of that classic work with its penetrating analysis of the philosophic foundations of arithmetic and geometry, and its clear formulation of the concepts of space, time, and relativity. The translation is ably done by Olaf Helmer and Joachim Weyl, the author's son. In addition, the book contains 80 pages of new material in the form of six appendices, the quality of which elevates this work to a unique rank in its field today.

With respect to subject matter, the appendices cover the most important topics of scientific methodology (the effects of Gödel's theorems on the structure of mathematics, quantum physics and causality, physics and biology). Their attractiveness is greatly increased, however, by the author's philosophic frankness, by his clear statements of the motives for his selection. Up to 1926, the continuous, extensive medium of space and time stood in the center of philosophic thought. Meanwhile, the discontinuous combinatorial structures of quantum theory, its concern for symmetries, have become increasingly significant. In view of this change, the new portions of the book attack "ars combinatoria" on a very basic plane and show its relation to several of the theories of modern physics. A new point of view is brought to bear upon the problem of chemical valence, and the only regret one might feel in reading Appendix D, which deals with it, is that the elegant treatment is so condensed as to leave it beyond the grasp of many workers in the field.

HENRY MARGENAU

Yale University

History of the primates: An introduction to the study of fossil man. W. E. Le Gros Clark. London: British Museum (Natural History), 1949. Pp. 117. (Illustrated.) 2s 6d.

That well-served character, the intelligent layman, will find here an answer to almost any reasonable question on present knowledge of the ancestry of man. The discussion is scientific in the best sense but is thoroughly readable and nontechnical. From the general principles of evolution and of classification through the fossil and recent lower primates to fossil man and the rise of *Homo sapiens,* the treatment is amazingly complete for so short a book, phrased in such easily comprehensible terms. Its excellent balance, its cautious and fair presentation of controversial points, and its inclusion of the most recent discoveries and studies make this surely among the best and perhaps quite the best available work on the subject for the layman.

The more professionally interested reader will be specially concerned with Professor Le Gros Clark's comments on the crucial and disputed episodes in human phylogeny. Although no one has better right to opinions on this subject, he presents the issues fairly and without ex-cathedra edicts, but he does quite properly weigh the probabilities.

The higher primates are suggested to have arisen from some of the more advanced Eocene tarsioids, rather than from lemuroids or less clearly differentiated prosimians. The hominoid group (including both apes and men) is believed to have had an independent origin among the tarsioids and not to have passed through a cercopithecoid stage. All the hominoids are indicated as having a common, ultimately monophyletic origin among unspecialized, mid-Tertiary apes from which arose the specialized recent apes, on one hand, and the hominids, on the other. Evidence for this degree of affinity of apes and men is seen among the generally primitive Miocene apes, still typified by *Dryopithecus,* although the group is now known to have been rather highly diverse and to have included, for instance, such forms as the somewhat chimpanzee-like *Proconsul.*

The South African Australopithecinae are stressed. The vexatious question of their generic and specific classification is evaded, and their essential common characters are described and illustrated without specification as to the several supposedly distinct types. The australopithecines as a group are regarded as closely related to man, either as direct ancestors or as little-modified survivors of an ancestral stock.

Pithecanthropus (including *Sinanthropus* as a synonym) is also considered directly ancestral to later hominids. It is suggested that descent from *Pithecanthropus* occurred in two different lines, one leading to the neandertaloids as a distinct, specialized offshoot that became totally extinct, and the other leading through such forms as the Swanscombe, Steinheim, and Ehringsdorf men to modern man, *Homo sapiens* strictly speaking.

Each of these phylogenetic decisions invites discussion and all will be disputed by one student or another. This is not the place to argue them, and the author continually emphasizes that they are matters of opinion in a field where too many of the facts still elude us.

The book contains no restorations of prehistoric men or other fossil primates and is not provided with a graphic phylogenetic tree. Most of the illustrations are factual drawings of living animals or of known fossil remains. The farthest departure from this objectivity is a diagram of the questionable Milankovitch-Zeuner chronology of the Pleistocene, and the provisional nature of this is duly noted.

This is a well-written, sound, modest book for which

we should be duly thankful. Wide distribution in the United States of this or of a comparably inexpensive American edition would be highly desirable.

GEORGE GAYLORD SIMPSON
American Museum of Natural History

Elmtown's youth: The impact of social classes on adolescents. August B. Hollingshead. New York: John Wiley; London: Chapman & Hall, 1949. Pp. x+480. $5.00.

Social class in America: A manual for the measurement of social status. W. Lloyd Warner, Marchia Meeker, and Kenneth Eells. Chicago: Science Research Associates, 1949. Pp. xiii+274. $4.25.

These two books, both written by sociologists, describe the social classes in a Midwestern town which is called Elmtown in one book and Jonesville in the other.

Elmtown's youth is "an analysis of the way the social system organizes and controls the social behavior of high-school-aged adolescents reared in it." The purpose of *Social class in America* is not the description of the town as such, but rather, the exposition of methods of analyzing social classes, with illustrative material drawn from this town.

Considered together, the two volumes detract from each other. Two sets of pseudonyms are used; yet the characters are recognizable from one book to the other, since the leading citizens and informers are naturally the same for both. Incidents are somewhat disguised to protect the identity of the inhabitants, and these disguises also vary, giving a feeling of unreality to the same events in this very real community.

Considered separately, the volumes represent two important contributions in the study of community life in America.

In *Elmtown*, Dr. Hollingshead found 735 adolescents of high school age in a community of some 10,000 people. The community tended to ignore the 345 adolescents who were not in school. In general, the children remaining in high school belonged to the families in better and more stable economic position.

Many fascinating details are given of the methods used to teach children "acceptable and unacceptable behavior relative to the family, the job, property, money, the school, the government, men, women, sex, and recreation. It is perfectly normal for families in the same or an adjacent [social] class, concentrated in a particular residential area, . . . to provide their children with significantly different learning situations from those of families in other classes who live in other residential areas."

The analysis of the process by which the young unskilled worker adjusts to the demands of the working world is particularly interesting. The adolescent takes a job to secure "freedom" (from school and from dependence on his parents). The jobs "are mean, dirty, undesirable, and generally seasonal or temporary." These factors "produce discontent and frustration, which motivate the young worker to seek another job, only to realize after a few weeks that the new job is like the old one." The average boy holds five jobs in his first year to a year and a half out of school. Afterwards, he becomes a more stable worker at a slightly higher rate of pay.

In *Social class in America*, Dr. Warner and his coauthors give two measures for analyzing social class. The crux of "Evaluated Participation" is persuading a community to judge each other's social class. "The Index of Status Characteristics" consists essentially of the sociologist rating the individual by judging his position in the social hierarchy in regard to occupation, source of income, house type, and dwelling area. These facts can ordinarily be secured easily.

The book is probably not the final one in the series written by Warner and collaborators. In the reviewer's opinion, there will be still further refinements of these measures. The present exposition will convince most readers, however, of the reality of social class; and will teach something about the methods of studying a community.

My own reaction to the scales of social class is that the values used for them are those of the small-town banker. Most scientists at one time or another must meet the inspection of the banker. But in addition, scientists class each other's prestige on a scale having little in common with the banker's.

A class structure for university scientists might be constructed along the following lines:

Upper-Upper.	Has the highest originality; constructs theories which other scientists test for years to come.
Lower-Upper.	Spends all possible time on research. Constructs theories dealing with limited areas. Envies the originality of the Upper-Upper.
Upper-Middle.	Is a revered teacher of younger scientists. Can verbalize the theories proposed by two upper classes adequately. Publishes an occasional research paper.
Lower-Middle.	Teaches other scientists, but has no reputation. Has published nothing but his doctoral dissertation.
Upper-Lower.	Teaches a scientific subject in a routine manner to students who are not enthusiastic. Turns in grades promptly at the end of the term.
Lower-Lower.	Fails to meet his classes. His students complain to the administration about him. His knowledge is limited; he takes to telling jokes unrelated to his subject.

A farming community such as Jonesville (Elmstown) places at the top people who have been prosperously living there for some generations. A group of scientists might place at the top an individual who has been rapidly promoted from one institution to another, with consequent impoverishment of his bank account, and with the additional factor that his neighbors in a physical sense might not know him. Sociologists will have to take account of the fact that the human being is complicated enough to strive in more than one type of prestige structure.

HELEN M. WOLFLE
American Psychological Association