to the limit of the student's capacity has ceased to be a privilege and has, instead, become a duty. This may well be in keeping with the problems and the temper of the times, yet it raises a question whose wide political and moral implications should be considered very carefully.

The cost of the book and the scholarly manner in which it is written and documented may prevent it from having the wide influence which this careful study deserves.

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Child Development and Personality. Paul H. Mussen and John J. Conger. Harper, New York, 1956. 569 pp. Illus. $6.

Since the turn of the century, child psychologists have been busily gathering a myriad of facts about their young subjects. Until recently, they have cataloged their findings in encyclopedic textbooks, stringing one fact after another rather precariously on the single strand of age development. The 3-year old does this, the 4-year old that. Child development progresses, apparently, with certain setbacks which at times impair the symmetry of the growth curves, but, in the past, textbooks have paid less attention to what may have preceded the setbacks than to the over-all (and by now reasonably dull) proposition that there is psychological growth with age. The fact is that, for most of the last half-century, child psychology has been purely descriptive, and the why's and wherefore's have been left to speculation.

In truth, it is difficult to escape the overpowering influence of the age factor in dealing with children. There is a certain regularity of development. On the other hand, there is an inescapable fact that many children of any one age have remarkably different personalities, and this fact, too, must be taken into the picture. Paul Mussen and John Conger have resolved this conflict between regularity (within very wide limits) and individual differences by examining the variations in children's experience. They have used a social learning interpretation of the researches at their disposal to analyze the many aspects of personality development. By this device, they have been able to avoid the purely descriptive approach and have been able to make a useful investigation of development in terms of antecedents and consequents. "The child's behavior, interests, attitudes and feelings are discussed from the points of view of: (1) factors in the child's background (biological, psychological, or social—and of course age is not neglected—) leading up to and influencing the development of these characteristics, and (2) the importance of these characteristics for the child's future development" (p. 7). What eventuates from this approach is a remarkably fruitful evaluation of the current state of our knowledge about the complicated process of personality development. This book will be welcomed, for this among other reasons, both by students of child psychology and by scholars in other fields—teachers, social workers, parents, pediatricians—whose work involves understanding of children's development.

Like most other contemporary child psychologists, Mussen and Conger attempt an evaluation of genetic factors in development before they examine the social learning factors in children's growth. It is in the latter area, however, that the most stimulating findings seem to have emerged recently. Some are at variance with one another, and many are imbued with that heat of controversy which inevitably seems to arise when a finding has some immediate social relevance. Mussen and Conger handle these controversial areas extremely well. The evidence for each relationship they examine is comprehensively reviewed, the possible effects of omissions in experimental controls are considered, and the reader is assisted to form an evaluation of a rather large area of work. All of this can lead to some better understanding of child psychology and of the nature of scientific method as well.

Unlike many other writers in this field, Mussen and Conger have not avoided those difficult areas that lead the student to evaluate evidence concerning the practical problems of bringing up children. Data are presented on such worrisome problems as the consequences of birth injury, premature birth, methods of infant feeding, "good mothering," and the like. It is my impression that many people who are presently, or potentially, anxious about these problems would do well to read the dispassionate but interesting accounts given here of the present state of our knowledge about these matters.

The book discusses development through the first 2 years, the preschool years, "middle childhood," and adolescence. There is a section on adjustment to school and another on adjustment to peers in the middle period. The adolescent section includes material on physical development and on adolescent adjustment in American culture. These sections, like others throughout the book, provide fresh material and a fresh type of thinking about old problems. In part, this is a function of cultural anthropological influence, which has recently had much impact on thinking in child development. Contrasts with the progress of child development in other cultures are instructive in helping the reader to assume some degree of cultural relativity in evaluating the process of growing up in this country.

Excellently documented, the text contains complete chapter references plus a name and a subject index. Names of investigators are sparingly used in the text itself. With a common-sense and lucid approach to the material, a set toward the promotion of "reasoning-about" phenomena rather than a recital of facts, and a suitable regard for the facts themselves, this book should do much toward making a number of people both more knowledgeable about child development and happier in their acquisition of that knowledge.

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The American Arbacia and Other Sea Urchins. Ethel Browne Harvey. Princeton University Press, Princeton, N.J., 1956. 298 pp. Illus. + plates. $6.

As a rule, in the literature of experimental biology the hero is some principle or method or even the experimenter himself. It is refreshing, therefore, to have a book in which the victim of the experiments is the hero. So, here is *Arbacia,* the "material" of countless experiments, treated in its own right.

The first section is a highly entertaining historical sketch of sea urchins through the ages and their natural history. The next is on the egg, the sperm, and development, and the last is on centrifuged eggs—a field which the author has made distinctively her own. The following third of the book consists of tables of work alphabetically arranged under subject headings. The bibliography contains more than 1500 items. These include all important publications on *Arbacia punctulata* and many references to work on other echinoids, although some important ones are omitted. Before the text, not numbered, are 16 pages of plates from photographs showing steps in the development of *Arbacia.* Although the plan is useful, some of the figures are too faint to convey meaning.

On page 198 there is an echo of the classic battle of the giants, in the inference that T. H. Morgan was the first to discover a physicochemical method of parthenogenesis. However, the fact is that Morgan, in his papers cited, describes only cytasters and cell division resulting in heaps of cells which soon perished, never becoming embryos. He emphatically denied the possibility of obtaining embryos by physicochemical activation of the egg. Astounded at Loeb's success in rearing apparently normal morulae, blastulae, gastrulae, and

plutei by this method, Morgan asked Loeb how he knew the larvae had cilia. To this Loeb gave his fitting and famous reply: "Because I drove each cilium in with a hammer!"

The book is a masterpiece of thoroughness and organization and will be of great value to the beginner in research and to the veteran investigator. The typography by the G. J. Thieme Press of Nijmegen, the Netherlands, merits special note, and is a delight to the eye.

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New Books

Introduction to Solid State Physics. Charles Kittel. Wiley, New York; Chapman & Hall, London, ed. 2, 1956. 617 pp. $12.

A Practical Manual of Medical and Biological Staining Techniques. Edward Gurr. Interscience, New York, ed. 2, 1956. 451 pp. $6.50.

Work, Workers and Work Measurement. Adam Abruzzi. Columbia University Press, New York, 1956. 318 pp. $7.50.

Petrographic Modal Analysis. An elementary statistical appraisal. Felix Chayes. Wiley, New York; Chapman & Hall, London, 1956. 113 pp. $5.50.

Educating Spastic Children. The education and guidance of the cerebral palsied. F. Eleanor Schonell. Philosophical Library, New York, 1956. 242 pp. $6.

Essentials of Histology. Margaret M. Hoskins and Gerrit Bevelander. Mosby, St. Louis, ed. 3, 1956. 254 pp. $4.

Research in the Effects and Influences of the Nuclear Bomb Test Explosions. pts. I and II. Compiled by the Committee for Compilation of Report on Research in the Effects of Radioactivity. Japan Society for the Promotion of Science, Ueno, Tokyo, 1956 (order from Stechert-Hafner, New York 3). 1824 pp. $26.50.

Preparing for Motherhood. A manual for expectant parents. Samuel R. Meaker. Year Book, Chicago, 1956. 196 pp.

Discovery of the Elements. Mary E. Weeks. Henry M. Leicester, Ed. Journal of Chemical Education, Easton, Pa., ed. 6, 1956. 910 pp. $10.

Science and Economic Development: New Patterns of Living. Richard L. Meirer. Technology Press, Cambridge, Mass.; Wiley, New York; Chapman & Hall, London, 1956. 266 pp. $6.

Minado. A tale of the Quebec wilderness. Erle Wilson. Appleton-Century-Crofts, New York, 1956. 191 pp. $3.50.

The Future of Arid Lands. Papers and recommendations from the International Arid Lands Meeting. Publ. No. 43. Gilbert F. White, Ed. American Association for the Advancement of Science, Washington, 1956. $6.75; $5.75, members.

The Nature of Brucellosis. Wesley W. Spink. University of Minnesota Press, Minneapolis, 1956. 464 pp. $8.

The Scientific Thought of Henry Adams. Henry Wasser. The Author, University of Salonika, Greece, 1956. 127 pp.

Changes of State. A mathematical-physical assessment. H. N. V. Temperley. Cleaver-Hume, London; Interscience, New York, 1956. 324 pp. $7.50.

Methods of Chemical Analysis for Soil Survey Samples. Soil Bureau Bull. 12. A. J. Metson. New Zealand Department of Scientific and Industrial Research, Wellington, 1956. 208 pp. 30s.

Engineering Analysis. A survey of numerical procedures. Stephen H. Crandall. McGraw-Hill, New York, 1956. 416 pp. $9.50.

Technology and Engineering. Reactor coolants, moderators, heat transfer, reactor chemistry, and corrosion of reactor materials. R. Hurst and S. McLain, Eds. McGraw-Hill, New York; Pergamon Press, London, 1956. 420 pp. $12.

Philosophy of Science. pt. 1, *Science in General.* Duquesne Studies, Philosophical Ser. 6. P. Henry van Laer in collaboration with Henry J. Koren. Duquesne University, Pittsburgh 19, Pa.; Nauwelaerts, Louvain, Belgium, 1956. 164 pp. Cloth, $3.75; paper, $3.

Contributions to the Theory of Nonlinear Oscillations. vol. III. S. Lefschetz. Princeton University Press, Princeton, N.J., 1956. 285 pp. $4.

Disposal of Sewage and other Water-Borne Wastes. Karl Imhoff, W. J. Müller, D. K. B. Thistlethwayte. Based on a translation of Imhoff's *Taschenbuch der Stadtentwaesserung,* ed. 16, 1956. Butterworths, London, 1956. 347 pp. 45s.

Up-Hill All the Way, the Life of Maynard Shipley. Miriam Allen DeFord. Antioch Press, Yellow Springs, Ohio, 1956. 255 pp. $4.

General Relativity and Cosmology. vol. 4 of International Astrophysics Ser. G. C. McVittie. Wiley, New York, 1956. 198 pp. $9.

Dendroclimatic Changes in Semiarid America. Edmund Schulman. University of Arizona Press, Tucson, 1956. 142 pp. $3.

An Introduction to Matrix Tensor Methods in Theoretical and Applied Mechanics. Sidney F. Borg. Edwards, Ann Arbor, Mich., 1956. 202 pp. $4.75.

Concise Anatomy. Linden F. Edwards. McGraw-Hill, New York, ed. 2, 1956. 502 pp. $7.50.

Lectures on Rock Magnetism. Being the second Weizmann Memorial Lectures, December, 1954. P. M. S. Blackett. Weizmann Science Press of Israel, Jerusalem, 1956. 131 pp. $5.

Conference on Tissue Fine Structure. Arden House, Harriman, N.Y., 16–18 Jan. 1956. Keith R. Porter, Ed. *Journal of Biophysical and Biochemical Cytology,* vol. 2, No. 4, pt. 2, suppl. Rockefeller Institute for Medical Research, New York, 1956. 454 pp. $5.

Biochemical Techniques, a Laboratory Manual. F. M. Strong. Burgess, Minneapolis, Minn., 1956. 78 pp. $3.

The Rabbit in Experimental Physiology. Harold M. Kaplan. Scholar's Library, New York, 1956. 69 pp. $2.50.

Chemical Engineering Practice. vol. 1, *General.* Herbert W. Cremer, Ed. Academic Press, New York; Butterworths, London, 1956. 494 pp. $13.30 per volume on orders for complete set; $17.50.

Polymer Solutions. H. Tompa. Academic Press, New York; Butterworths, London, 1956. 325 pp. $8.50.

Rattlesnakes. Their habits, life histories, and influence on mankind. vols. 1 and 2. Laurence M. Klauber. University of California Press (for the Zoological Society of San Diego), Berkeley, 1956. 1476 pp. $17.50 per set.

Fundamentals of Immunology. William C. Boyd. Interscience, New York, ed. 3, 1956. 776 pp. $10.

The Earth We Live on. The story of geological discovery. Ruth Moore. Knopf, New York, 1956. 416 pp. $6.

Miscellaneous Publications

(Inquiries concerning these publications should be addressed, not to Science, *but to the publisher or agency sponsoring the publication.)*

Annotated Bibliography of Geologic and Soils Literature of Western North Pacific Islands. Helen L. Foster. U.S. Army, Chief of Engineers, Washington 25, 1956. 884 pp.

The Plankton of the Beaufort and Chukchi Sea Areas of the Arctic and Its Relation to the Hydrography. Arctic Institute of North America Tech. Paper No. 1. Martin W. Johnson. Arctic Institute of North America, Montreal, Canada, 1956. 32 pp. $0.50.

Ruwenzori Expedition, 1934–35. Tipulidae. vol. 1, No. 7. Charles P. Alexander. British Museum (Natural History), London, 1956. 251 pp. £3.

Trends in the Employment and Training of Scientists and Engineers. Prepared for the National Committee for the Development of Scientists and Engineers. National Science Foundation, Washington, 1956 (order from Supt. of Documents, GPO, Washington 25). 23 pp. $0.20.

Crustacean Metamorphoses. Smithsonian Misc. Coll., vol. 131, No. 10. R. E. Snodgrass. Smithsonian Institution, Washington, 1956. 78 pp.

A Short Course in Radiological Protection. A.E.R.E. H.P./L. 23. Health Physics Division and Isotope School A.E.R.E. R. J. Sherwood and H. J. Dunster, Eds. Atomic Energy Research Establishment, Harwell, England, 1956. 100 pp. 3s. 3d.

Rapport Annuel sur le Fonctionnement Technique de l'Institut Pasteur de Saigon, 1955. Instituts Pasteur au Viet-Nam, Saigon, 1956. 114 pp.

Symposium on Rock Mechanics. Papers and discussion from the 1st annual Symposium on Rock Mechanics, Colorado School of Mines 23–25 Apr. 1956. Quarterly of the Colorado School of Mines, vol. 51, No. 3. Colorado School of Mines, Golden, 1956. 239 pp. $2.

Developments in the Accreditation of Teacher Education in the United States. National Catholic Education Association Special Study No. 1. George F. Donovan. National Catholic Educational Association, Washington 6, 1956. 66 pp. $1.25.

Landscape Evolution in the High Ituri Belgian Congo. Série Scientifique No. 66. Robert V. Ruhe. Institut National pour l'Étude Agronomique du Congo Belge, Brussels, 1956. 108 pp. F. 90.