

McGraw-Hill Encyclopedia of Science and Technology

An encyclopedia of science and technology that attempts to cover such topics as abacus, abalone, abdomen, and aberration (optical) in successive entries, and all fields of scientific information in some 14 volumes of text and one of index, is a bold venture indeed. That such a work as the 15-volume **McGraw-Hill Encyclopedia of Science and Technology** (McGraw-Hill, New York, ed. 2, 1966. 9557 pp., \$295) is now in its second edition indicates that it does fill a need in libraries and schools and that it serves a useful purpose. [The first edition of the encyclopedia was reviewed in *Science* **133**, 374 (1961).]

Since we can no longer afford either the funds or shelf space for a work of the scope of the famous ninth edition of the *Britannica*, whose major entries were indeed a summary of all knowledge on the subject to that time, we have come to accept specialized encyclopedias such as this as useful, if they succeed in presenting enough information to satisfy the curiosity or needs of a nonspecialist. Of course the specialist may feel that a given article is really not detailed enough even for that purpose, and there are some articles in this encyclopedia which could have been more informative. The discussion of the abacus, for example, does not tell the reader how to use one, and the article on the abdomen never really tells the reader what an abdomen is and erroneously restricts it to vertebrates. Yet the article on aberration (optical) is four pages long and bristles with equations, diagrams, and details. These imbalances were present in the first edition and have been carried through to the second. On the whole, the encyclopedia is much stronger in its treatment of technology, instruments (but not of the typewriter, alas!), physics, geology, and experimental aspects of biology (for example, behavior, cell, endocrinology, and embryology) than in descriptive biology and natural history.

Fortunately an encyclopedia cannot be judged like a chain, by its weakest links, for by that token no encyclopedia could be considered very good. On the whole the majority of the articles are excellent and convey enough detail to satisfy ordinary needs for information; one can, for example, find enough about distillation to produce usable results, or enough about computers to build a small analog com-

puter, and enough about physiology to pass a 1A final. It is disconcerting, however, to find such a large accumulation of weak links concentrated in the field of descriptive biology; in particular the entries on mollusks (except Cephalopods) range from the amateurish to the erroneous, in strong contrast to the detailed professional articles on orders of insects, crustacea, and echinoderms. The recent vertebrates as a whole come off rather poorly; there are no entries for orders of birds and mammals comparable to the entries devoted to insects, and the discussion of higher plants is also rather skimpy. The editors could have improved this edition considerably by removing a large number of pot-boiler items in favor of better treatment of the entries. Why should there be all of these little squibs on various animals, ranging from abalone to zebra (but not aardvark or pangolin) and including snails and slugs? Such information can be found in any natural history compendium (and perhaps better done). At the same time one has to know that the best place to look for a discussion of *Fucus* is under the Phaeophyta. Oddly enough this principal reference to *Fucus* is not indexed, although two passing mentions are. This is in spite of the obvious attention that has been paid to the preparation of a useful index; it is unfortunate that the search for *Fucus* was my first test of the index. Aardvark is buried in volume 14, under Tubulidentata and Tubulidentata fossils, incidentally.

In view of the obvious effort that was made to assemble the best possible authorities for most of the subjects, and the resulting excellent entries, it is strange that whole blocks of entries were contributed by industrious hacks. Most of these are under common names, although at the same time much the same material is included under more technical terms. Sometimes the information is directly contradictory. In volume 9, for example, there are consecutive entries for Nudibranch and Nudibranchia by different authors. The first article states that "their basic anatomy is similar to that of the mussel and the snail" and that they lack true gills. It then proceeds to refer to them as sea cucumbers, and concludes with the statement that "Sea cucumbers are sometimes incorrectly called sea slugs," whatever that is supposed to mean. While nudibranchs are called an order, the Nudibranchia are called a suborder,

with gills of variable size and position, and are said to be very beautiful animals. The reader is referred to Opisthobranchia, stated to be a subclass containing, by implication, a group of suborders in which the gills when present are posterior to the heart, and so forth. Nowhere in the 14 volumes is there an adequate diagram of the basic anatomy of a mussel, snail, gastropod, pelecypod, or any mollusk at all to explain these foggy allusions. Of course, this information is available in numerous high school and college texts. Such essentially uninformative entries are much less frequent in the physical sciences and technology, and as a whole the work achieves its purpose. The new edition contains much added material (accommodated by the device of a-b pages), illustrations have been replaced, and the index has been completely overhauled.

In preparing this review I have had helpful advice from several of my colleagues.

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Waning of the "Two Cultures"

The provocative "Science and culture" number of *Daedalus* (winter 1965) is now available in hard covers. **Science and Culture: A Study of Cohesive and Disjunctive Forces** (Houghton Mifflin, Boston, Mass., 1965. 348 pp., \$6), edited by Gerald Holton, is a bright collection of essays whose sum is to dismiss the C. P. Snow "Two Cultures" thesis once and for all and to leave a host of new questions.

Holton has brought together 16 distinguished authors of widely representative disciplines in a critical reformulation of the Snow thesis. The editor's introduction attempts to knit the contributions into sharp focus on this theme. Happily this attempt is befuddled by the essays themselves which tend to march off in all directions. What emerges is a new and deeper focus: science reduced to a salient but hardly central vector of current cultural change, and the "Two Cultures" concept dissolved into a melange of more significant and less manageable disjunctions than those between technical and nontechnical education.

The book gains coherence from the uniformly high style and logical rigor of its contents. Though disparate in attitude, the essays achieve a certain unity