serious thinking about the subject matter of this volume. Unless general congresses are more highly appreciated, Professor Spärck's remarks may have been made in vain.

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Through Alchemy to Chemistry. A procession of ideas and personalities. John Read. Bell, London, 1957 (order from Macmillan, New York). xvii + 206 pp. Illus. $3.75.

John Read has added to his books on organic chemistry and alchemy a new and particularly delightful survey of historical developments from alchemy to present-day chemistry. Although only 206 pages long, including three of glossary and ten of index, this is a very readable introduction to the history of chemistry. The emphasis rests on alchemy, the discussion of which comprises about one-half of the volume. Although the story of Paracelsus does not begin until the seventh of the ten chapters, some main lines of "modern" chemistry are clearly and effectively drawn. However, Read confines this part of the picture too severely and shows only something of the chemicals, nothing about chemical reactions.

The short biographies are masterly, informative, and entirely reliable. For example, Lavoisier's work in "agriculture and many other national matters" is not omitted, as it sometimes is even in larger histories of chemistry.

The text is enlivened by 50 illustrations, showing portraits, equipment, and working scenes, including the "tailpiece" from J. B. Porta's book of 1608 on distillation.

This is the sort of book which makes a welcome gift for students of any kind and age, providing relaxation and stimulation.

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Die Evolution der Organismen. Part 4; part 5. Gerhard Heberer, Ed. Fischer, Stuttgart, Germany, 1955; 1957. 143 pp.; 252 pp.

The new edition of the great German handbook of evolution is nearing completion with publication of the five chapters of the two latest installments. A sixth and final part is in preparation.

Part 4 begins with a discussion by Franz Schwanitz of the origin of cultivated plants. In his classic *Origin of Species,* Darwin very effectively used the origin of cultivated plants and domestic animals to substantiate the all-importance of selection. A review of the results of plant and animal breeding is therefore a legitimate component of a modern review of the theory of evolution. In this survey of plant breeding, Schwanitz finds confirmation for Darwin's contention that selection can create almost anything it wants. Varieties of plants have been produced with large size, high productivity, the loss of certain undesirable characteristics, high or low variability, or other, sometimes highly improbable, attributes. The changes occur amazingly fast if large enough numbers of individuals are available for selection. Here we have experimental evolution in its truest form. Schwanitz presents the recent results in this field and attempts to determine the respective contribution of mutation (including chromosomal mutations and polyploidy), hybridization, and other factors. It is a competent treatment of the established knowledge, with an apparently deliberate avoidance of some of the more controversial and more speculative aspects of the field.

The corresponding chapter on animals, by Herre, brings together much of the exceedingly scattered literature on the domestication of animals. Earlier claims for a hybrid origin of domestic animals have not been confirmed; indeed, conclusions drawn from the detailed analyses of fossils associated with prehistoric man are in complete opposition to such an interpretation. There is great parallelism in the phenomena of domestication, not only when different species of wild animals are brought into domestication but also when the same species is repeatedly domesticated in different areas. Herre particularly emphasizes the effects of domestication on various organ systems, such as the endocrine, and on body proportions, somewhat along the lines of Stockard's work.

Much in current accounts on domestication is still descriptive and anecdotal. Indeed one has the feeling that the biology of domestication is a potential gold mine, of which only the surface has so far been scratched. The most recent findings of population genetics, for instance, have hardly been applied to an interpretation of the phenomena of domestication. The breakdown of developmental and genetic homeostasis in the wake of one-sided selection is, as Lerner has pointed out, undoubtedly one of the main causes of the domestication phenomena.

The various theories concerning the origin of new phyletic types are discussed by Heberer in a chapter (the first of part 5) that is particularly valuable from the standpoint of methodology. Heberer shows that the concept of gradual evolution is favored by all the available evidence and that the hypothesis of the origin of new types through saltations (macromutations) is based on a misunderstanding of known genetic mechanisms. The phenomena of mosaic evolution (particularly among so-called "missing links") and the invariable coincidence of gaps in phyletic series with gaps in the fossil record greatly strengthen the theory of gradual evolution. The documentation of this thesis by Heberer is broad and convincing, and it contains much that is new and original.

Von Krogh gives an orthodox summary of the anatomical similarities and differences between man and the other primates. The fossil history of man is presented by Gieseler in great detail (159 pages) and with abundant illustrations. As a summary of the literature this account is very useful. Unfortunately there is little attempt at synthesis. On the whole, *Pithecanthropus, Sinanthropus,* Neanderthal, and so on, are still presented as so many "types" of fossil hominids, without any real biological interpretation. As long as only a few scattered remains of fossil man existed, no other course was open. The time has now come, however, for bold hypotheses aiming to make sense of the diversity of remains of fossil man. Such hypotheses can be made only through analogy with the variation, in space and time, of other species of mammals.

The work continues to be very attractively illustrated. It contains an unusual amount of material that would be suitable as illustration for lectures and in the classroom.

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Electron Microscopy. Proceedings of the Stockholm Conference, September 1956. F. S. Sjostrand and J. Rhodin, Eds. Academic Press, New York, 1957. xi + 355 pp. Illus. $17.50.

The papers presented at the Electron Microscopy Conference held in Stockholm in September 1956 are divided into 14 sections: "Instrumentation," "Electron Optics," "Electron-Specimen Interaction," "High Resolution Electron Microscopy and Electron Diffraction," "Specimen Preparation Techniques in Biology and Science," "Cell Ultrastructure, General," "Nerve Cells and Receptors," "Muscle and Other Contractile Elements," "Collagen, Cartilage, Bone," "Pathology," "Microbiology," "Botany," "Paper and Textile Research," and