Book Reviews

No Frontier to Learning. The Mexican student in the United States. Ralph L. Beals and Norman D. Humphrey. University of Minnesota Press, Minneapolis, 1957. xi + 148 pp. $3.25.

This is fascinating reading. Ten Mexican students at the University of California (Los Angeles) were intensively interviewed and tested (from 4 to 20 hours) about such things as their motivations in coming to the United States, their attitudes toward American culture before, during, and after their period of study, their problems of linguistic, academic, and social adjustment, and their beliefs about the value of their foreign study upon returning home. An additional 42 Mexican students supplied supplementary information. Twenty-six Mexican students who had returned were interviewed in Mexico. The methodological approach is anthropological; a senior author with over 25 years, and a junior author with 15 years, of first-hand acquaintance with Mexico and Mexican culture worked intensively with relatively few subjects. I believe that the conclusions reached are accurate and that extensive use of questionnaires among a larger sample would have produced few differences. Nevertheless, a follow-up in other parts of the United States would be of interest: only eight of the 52 students resided outside of California.

Some of the findings are as follows: most of the students come from middle- and upper-class urban backgrounds; all reflect considerable anti-American feeling, in considerable measure because of historical reasons rather than personal experiences; the desire of many to study in colleges in the United States is motivated by a sense of social obligation and the wish to do something for Mexico; most students would have preferred to study in Europe; most students adjust to United States culture more readily than does the average foreign student. The students' attitudes became modified in the direction of greater egalitarianism, increased cooperativeness, greater open-mindedness, and more feelings of social responsibility. Many shifted from a position of hostile criticism to friendly criticism, but all continue to believe in the basic superiority of Mexican life goals, "with their emphasis on spiritual and humanistic values." Discouragingly, most returned students find a cultural climate in which they often must be overtly anti-American in order to be accepted and to get ahead in their fields. The authors point out that if the major objective of exchange programs is to secure wholehearted approval of the United States by foreign students, the Mexican experience indicates that this goal is not reached. In broader perspective, the reader is left with the conviction that both Mexico and the United States profit from the presence of the Mexican student in this country.

Would it be in order to suggest that a companion study, "The American Student in Mexico," would be equally desirable?

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Proceedings of the XIV International Congress of Zoology. Copenhagen, 5–12 Aug. 1953. Danish Science Press, Copenhagen, 1956. 567 pp. Illus. Paper, Kr. 100.

The proceedings of the 14th International Congress of Zoology, held in Copenhagen in 1953, were published last year but only recently received wide distribution. Delegates from 34 countries and three international institutions were present. It may be of interest to note that 501 members took part, in contrast to the 707 who participated in 1927 in Budapest, where the tenth congress was held.

A casual reader may well ask: What goes on at an international congress of zoology? By way of answer, this volume clearly says, "All sorts of new and old biological ideas are discussed, and many viewpoints are interrelated." In addition to the general meetings, which covered subjects such as fauna protection, improving zoological nomenclature, growth of marine populations, paleoecology and adaptation, and thinking without words (precursors to language), and films on the Galathea Expedition, the history of the eel, and the flight of insects, there were 16 sectional meetings, at each of which some 10 to 25 papers were presented. Some sample groupings are paleozoology, evolution, cytology, morphogenesis, psychology, comparative physiology, serology, parasitology, nematology, hydrobiology, and anthropological systematics.

It would be all too easy to suggest that this eclectic collection is without great permanent value, or that zoological congresses are scientifically passé. A brilliant defense of general meetings is found in Professor Spärck's presidential address of welcome. He faces the problem courageously: "Some people are of the opinion that in zoology specialization has now developed so far, that we should stop having general congresses of zoology, and only have congresses of specialists. . . . It is important not to forget that the animal Kingdom is a part of nature, that a zoologist is a naturalist, that the problems of cytology, biochemistry, physiology concern living animals, reacting as a whole organism against ecological factors and other organisms. . . . Apart from the lectures, excursions, and personal contacts, the congresses are a very important factor in international cooperation. They are a counterweight against isolation, which is so dangerous to the progress of Science."

Brief mention of a few of the subjects discussed and of their proponents may illustrate the true value of this triennial meeting: the giant mitochondria of insect muscles (C. Williams); representative Mediterranean fauna in the Caspian Sea (L. Zenkevitch); radiation effects on regeneration of invertebrates (E. Wolff); nucleolar extrusion in amebae (D. L. Ray); olfactory sense of dogs in relation to fatty acids (T. Uchida); proposals for international agreement on normal stages in vertebrate embryology (E. Witschi); control of tube-worm growths in a British tidal harbor lake (N. Tebble); tumorgenesis in invertebrates (J. Wautier); the biology of Atlantic seals (a new color film, presented by L. H. Matthews); toxonomic characters of Old World monkeys (M. Friant); specificity of food plants for insects (G. Fraenkel); and ways of stabilizing zoological nomenclature (C. L. Hubbs). Unfortunately, many papers were not up to the standards of these.

The congress was convened under the auspices of the Danish Government and the University of Copenhagen. Financial aid was received from the Carlsberg and Tuborg brewing industries. The volume contains a few figures and an index and has a paper cover of good quality. One may well ask why some 13 authors could not take the trouble to submit abstracts. Biologists generally, and zoologists in particular, should do some

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