as a surprise containing surprises, for it presents such a logical, forceful analysis of the outcome for other animals of the human population explosion around the world. He argues, on the one hand, for a few natives and man-set fires in wildlife reserves—to continue the evolutionary pressure to which wildlife and the vegetation have become adapted. On the other, he clearly wonders how a sanctuary, even as large as Kruger National Park (the size of Massachusetts or New Jersey), can be meaningful as an island of wilderness if there is no genetic interchange with kindred animals and plants from beyond its boundaries. How can the enclosed creatures continue their evolution in an unchanged direction, if they are confined in this way?

That Cowles' last visit to Natal was in 1953 does not date his book. We tramped over many of the same hillsides during July and August of 1959, and found the deterioration of the soil, the problems of management, the tensions between people over the future, all just a little more acute and desperate than is told in *Zulu Journal.* To Cowles' credit, he has underplayed the political background of the South African scene and focused more attention on the world-wide problems—the survival of wild animals, native plants, and primitive people in the face of unchecked increases in human population.

The book should be read carefully by all who are concerned with man's future—even his near future.

LORUS J. MILNE
MARGERY MILNE
Department of Zoology,
University of New Hampshire

Human Nutrition and Dietetics. Sir Stanley Davidson, A. P. Meiklejohn, and R. Passmore. William and Wilkins, Baltimore, Md., 1959. xii + 844 pp. Illus. $15.

Three Edinburgh men—Sir Stanley Davidson (professor of medicine), A. P. Meiklejohn (lecturer in nutrition), and R. Passmore (reader in physiology)—have banded together to produce the best textbook on nutrition presently available to the graduate student, the scientist, or the internist. The combination of their talents is unusual. Davidson, an excellent clinician, has made distinguished contributions to a number of fields in medical investigation. Meiklejohn, well known in this country as a clinician, has had extensive practical experience as consultant in nutrition for the United Nations Relief and Rehabilitation Administration. Passmore, a man with wide interests in the physiology of nutrition, served for many years in the Indian Medical Service, in particular at Coonoor.

This large volume (844 pp) is divided into six main sections: Physiology, Foods, Primary Nutritional Diseases, Nutritional Aspects and Dietetic Treatment of General Diseases, Public Health, and Diet and Physiological Stress. The first part deals with the more classical aspects of the biochemistry and physiology of nutrition, including the mechanism by which food intake is regulated. The references and illustrations are judiciously chosen, and in every respect the book meets the highest requirements for scholarship. That it does so without being unusually wordy is particularly well illustrated by chapter 7, "Alcohol," which in the space of only 2½ pages (five bibliographical references) manages to give a superb summary of present knowledge of the place of alcohol in nutrition.

My only reservation about the first part is that the authors could have provided a better discussion of the basis on which various sets of requirements or recommended allowances have been established.

The second part is particularly useful. It deals with the various types of foods into which, ultimately, nutrition is translated. There is a useful section on preserving, cooking, and wastage, as well as a section on food poisons.

The section on subnutrition and starvation, as well as that on obesity, could usefully have been amplified. These topics are dealt with in a fairly cursory manner and, particularly obesity, without too much originality. This is all the more surprising because few people in the world have had as much extensive firsthand experience with the problem of subnutrition as Meiklejohn and Passmore, and, for that matter, few people have written as well on the subject as Passmore. It is to be hoped that in the second edition this important subject will be discussed more fully. Similarly, obesity is a field to which both Passmore and Meiklejohn have contributed and continue to contribute. The emphasis placed on this subject in the teaching of present day nutrition should entitle it to a somewhat more detailed presentation than is accorded it in *Human Nutrition and Dietetics.*

The sections on nutritional deficiencies are good, and they are particularly well illustrated. Section 4, Nutritional Aspects and Dietetic Treatment of General Diseases, is excellent, though it may, perhaps, reflect British practices too much for literal application to American hospitals and institutions.

Part 5, on public health nutrition, is excellent; it includes a wise appraisal of the social as well as the technical factors to be taken into account when dealing with the nutritional practices of populations.

A final (and very brief) part deals with diet and physical stress. The description of the management of children's diets could have been somewhat more detailed, and the common criteria for evaluating the adequacy of diet for growth could have been discussed at somewhat greater length. Other chapters in this section, dealing with athletics, effects of climate, expeditions and emergency rations, are consistent with the excellent quality of the book.

The existence of this book will make it much easier for anyone teaching nutrition to advanced students to organize a course based on readily available references. It should make it even more difficult to justify the omission of a course in human nutrition in the training of medical students.

JEAN MAYER
Department of Nutrition,
Harvard School of Public Health

Covered Wagon Geologist. Charles Newton Gould. University of Oklahoma Press, Norman, 1959. xiii + 282 pp. Illus. + maps. $4.

This is the autobiography of a pioneer geologist who worked in Oklahoma and the surrounding areas. His professional activities covered the 60 years prior to his death in 1946, and one of his early field vehicles *was* a covered wagon, though he did not make any transcontinental trips in it.

If you are a geologist working in the mid-continent area, you will probably want to read this book at one sitting. If you are a geologist working elsewhere, you should have it in your library because it is rich in allusions to the development of our present knowledge of the fundamental geology of Gould's sphere of interest, much of which was developed by Gould himself in his various posts. He was a teacher who initiated the geology curriculum at the

University of Oklahoma, he was a consulting geologist who found some oil fields for others (but not for himself), he organized the Oklahoma Geological Survey, he was geologist for the National Park Service, and most important, he trained men who were successful when measured by the criteria of their colleagues. At times, he was doing all these things at once, at times separately, and he found time to publish 260 papers, write 572 reports on oil properties, and complete 251 reports for the Park Service!

Like many others, Gould was born, in 1868, in a log cabin in Ohio and grew up in a dugout on the Kansas prairie. And like hundreds of others, he had tough going to get through school. But the chance hearing of a lecture on geology determined his future, and he left no stone unturned, literally, to complete his education in this field and to pursue it usefully all his life.

While it is not clear whether Gould developed his book from a journal or from a diary, we know that geologists are great note-takers and file-keepers, and we may, thereby, trust the historical data. Some readers may feel that *Covered Wagon Geologist* is not great literature, but it is better than average and will certainly hold a reader's interest. This is fundamental stuff in the history of North American geology, even though it is somewhat provincial. I am grateful to Gould for his story, but even more grateful to a group of Oklahoma geologists who helped insure its publication.

V. L. VANDERHOOF
Santa Barbara Museum of Natural History, Santa Barbara, California

Handbuch der Physik. vol. 41, part 1, *Nuclear Reactions* 2, *Theory*. S. Flügge, Ed. Springer, Berlin, 1959. vii + 580 pp. Illus. DM. 145.

Gregory Breit (Yale University) and his collaborators—M. H. Hull, Jr., J. S. McIntosh, and R. L. Gluckstern—are the authors of the articles in this volume of the new *Handbuch der Physik*. As is well known, Breit has played an important role in the development of the theory of nuclear reactions. We note his early work on charged particle reactions and, of course, his derivation, with E. Wigner, of the justly celebrated Breit-Wigner formula; this formula not only has proved to be fundamental for the analysis of experimental results on resonance reactions, but its publication also initiated (simultaneously with N. Bohr) the important concept of the compound nucleus. This volume, like all Breit's work, is a careful, detailed, yet stimulating exposition of the subject; its approach is very strongly based on physical insight with a great deal of attention being paid to classical or semiclassical formulations.

The first and longest article, entitled "Theory of Resonance Reactions and Allied Topics" (pages 1–407), is by Breit. Its main purpose is twofold: (i) the more or less qualitative understanding of resonance reactions and (ii) the derivation and application of the Wigner R matrix theory. In the first category, we place his section B, "Elementary viewpoints and simpler models," which includes a discussion of resonances for central field two-body encounters, of his schematic model for the many channel situation, and an interesting semiclassical discussion. In section C, the Wigner development is given a very full treatment, and all details required for its use are included as far as I can see. Section D deals with a variety of topics: the optical model, stripping reactions, alpha particle decay, and heavy particle reactions.

Even in an article as long as this, it is inevitable that a number of topics are not included or are only briefly mentioned. These include the statistical theory of nuclear reactions (the Wigner statistical R matrix is briefly discussed) the theory of direct interaction (stripping and pickup are given a very detailed analysis), and gamma ray processes in resonance reactions (the dipole emission probability is calculated on the basis of the schematic model). Finally for the reader who may miss Breit's explicit mention of it, Breit's Γ is double the usual one.

The second article, "Coulomb Wave Functions" (pages 408–465), (written with M. H. Hull, Jr.) is a full and extremely useful summary of the various properties and approximation for these functions which are so important for the discussion of charged particle reactions. A complete list of all the available tables as of 1958 is given.

The third article (written with J. S. McIntosh) is entitled "Polarization of Nucleons Scattered by Nuclei" (pages 466–495). It deals with this subject in terms of the von Neumann statistical matrix and for the most part uses the methods of Wolfenstein. Scattering by spin 1/2 nuclei of spin 0 and spin 1/2 particles is considered in detail.

The fourth and final article (written with R. L. Gluckstern) is on Coulomb exitation (pages 496–558). The classical and quantum mechanical treatments are both discussed.

This volume is an important addition to the literature on nuclear reactions. It is fundamentally a review but differs from many reviews in that it is a critical review, well organized and useful, containing much that is original. Every physicist interested in nuclear reactions needs to read it.

One final comment which has to do with the editing of this series: it seems a pity that the subject index in this volume, as well as in the others I have examined, is so short and that there is no author index.

HERMAN FESHBACH
Department of Physics, Massachusetts Institute of Technology

New Books

Advances in Spectroscopy. vol 1. H. W. Thompson, Ed. Interscience, New York, 1959. 374 pp. $12.50.

Aerial Photographic Interpretation. Principles and applications. Donald R. Lueder. McGraw-Hill, New York, 1959. 477 pp. $17.50.

The Analysis of Variance. Henry Scheffe. Wiley, New York; Chapman and Hall, London, 1959. 493 pp. $14.

Comparative Anatomy of the Vertebrates. Theodore H. Eaton, Jr. Harper, New York, ed. 2, 1960. 391 pp. $6.

Dictionary of Economic Plants. J. C. Th. Uphof. Hafner, New York, 1959. 408 pp. $9.75. Brief descriptions, alphabetically arranged, of more than 6000 plants. Lists common and scientific names, reviews geographical distribution, and lists products derived from the plants.

Fundamentals of Guided Missiles. Air Training Command, U.S. Air Force, and Technical Staff, Aero Publishers. Aero, Los Angeles, Calif., 1960. 605 pp. $12.50.

Evolution and Christian Thought Today. Russell L. Mixter, Ed. Eerdmans, Grand Rapids, Mich., 1959. 224 pp. $4.50.

Handbook of Industrial Research Management. Carl Heyel, Ed. Reinhold, New York; Chapman and Hall, London, 1959. 530 pp. $12.

L'hérédité moléculaire. Conditions normales et pathologiques. Jean de Grouchy. Instituto Gregorio Mendel, Rome, 1958. 360 pp.

Industrial Complex Analysis and Regional Development. Walter Isard, Eugene W. Schooler, Thomas Vietorisz. Technology Press of Massachusetts Institute of Technology; Wiley, New York; Chapman and Hall, London, 1959. 311 pp. $8.75.