translator adds Evvard), Falkovich, Puckett, Khaskind, Frankl, Gurevich, Karpovich, and Hayes. The work is dense with calculations, but the mathematics is simple and within reach of the aeronautical engineer. The "approximations" are heuristic and formal, there is no trace of what a mathematician would regard as a precise theory. The authors make no mention of the extensive literature arguing in favor of retaining terms they throw away or of throwing away terms they retain, as is usual among perturbationists. Thus they give the linearized theory an appearance of finality which would be destroyed by any more catholic presentation of the field.

The translator tells us he has made a literal translation, "with no effort . . . to impose the translator's style on the author's intentions." However, he has added at least one reference (to himself) and one plate without any special notice; what else he may have changed we can only guess. In some places he appears to preserve the Russian word order, and surely we cannot blame the author for "make $\partial\phi/\partial t$ to vanish" (p. 5), "the formula for the pressure is derived, now" (pp. 6–7), "to show that the wave equations, is satisfied" (pp. 11–12), "the body generatrices" (p. 22), and so forth, not to mention the many misspellings.

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Protein Metabolism. R. B. Fisher. Methuen, London; Wiley, New York, 1954. ix + 198 pp. Illus. $2.50.

This interesting and thoughtfully written little book is the latest member of the excellent series known as *Methuen's Monographs on Biochemical Subjects.* Like its predecessors, it is pocket-sized and very convenient to carry about for perusal at odd times.

It is the stated purpose of the author to "re-view" the essential knowledge of protein metabolism and to remind the reader of the possibility of reinterpreting discovered facts in the light of later findings. He is interested in redirecting the student to some of the older literature and is opposed to the rather popular notion that what is latest is always best.

There are seven essays, all but one accompanied by a conclusion. There is a general conclusion at the end of the book. The essays are: I, "Digestion and absorption of protein"; II, "The overall picture of protein metabolism"; III, "The metabolic significance of specific enzymes"; IV, "General aspects of the metabolism of the amino acids"; V, "The use of isotopes in the study of protein metabolism"; VI, "Metabolic and endocrine interactions in protein metabolism"; and VII, "The nutritive value of proteins." In each case the author undertakes to question current hypotheses, particularly in those cases where the physiological point of view seems to have been lost sight of or neglected. His central theme is that protein metabolism must be considered to be the metabolism of the amino acids in concert and that, of the variety of chemical and physiological factors which are kept in balance, no one can be neglected indefinitely.

Among the questions raised are included the examples that follow. It is my opinion that reappraisals which are the heart of this small volume may well stimulate future studies. Fisher, who is demonstrator in biochemistry, University of Oxford, considers that it is not firmly established that the "currency" of protein metabolism is amino acids. There is a distinct possibility that small peptides may fulfill such a role. There is no complete assurance that amino acids only are the end products of digestive proteolysis. The time required for complete digestion of proteins by protease action *in vitro* seems to be at variance with any assumption of complete hydrolysis.

It is the author's view that protein synthesis involves not only competition for precursors but also secondary physiologic influences which affect the synthetic process. In the light of present data, transamination, deamination, and the urea cycle seem to be somewhat lacking insofar as detailed knowledge of protein catabolism is concerned. The author is quite skeptical of experiments which have involved feeding a high level of a single amino acid along with an already adequate protein intake. He feels that studies with isotopically labeled amino acids have led to real advances in understanding in spite of certain difficulties of interpretation.

This book is to be recommended as a stimulating and brief analysis of a very complex active research area.

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Structure Reports for 1950. vol. 13. A. J. C. Wilson, Gen. Ed.; N. C. Baenziger (Metals), J. M. Bijvoet (Inorganic compounds), and J. Monteath Robertson (Organic compounds), Section eds. Oosthoek, Utrecht, Holland, 1954 (For the International Union of Crystallography. viii + 643 pp. Illus. $21.50.

This is the fourth volume of the series to be published, and it is the latest step in the process of catching up with publications of structural interest during the period since the last issue of the *Strukturbericht,* vol. VII for 1939. Like most workers concerned with structural studies, I turn to each of these reports as they appear to see not only what articles of importance I may have overlooked but also whether I have fully appreciated all important points in the articles I have supposedly read. For these are not abstracts in the ordinary sense; they aim to survey structural work so fully that nothing further would be gained by consulting the original papers. Indeed, these reports may go even further, for the abstractors sometimes give their own comments on the work. For example, their own calculations of interatomic separations may be compared with those in the literature. This is a wonderful service for all structure analysts, and one wonders whether the editors and their col-

laborators will be able to maintain this high level of performance year after year. However, in this fourth volume, the original standard is fully maintained.

All libraries carrying scientific books must have at least one set of this series. Individual crystallographers will also want to possess their own copies, and if *Structure Reports* would catch up a little more rapidly with current work, they might seriously contemplate canceling numerous subscriptions to journals and societies and rely on the reports. Unfortunately, the cost seems to be rising to a level at which few individuals will buy their own copies. Now that the series is getting well past the period of World War II, the amount of work to be summarized is likely to require larger and still more expensive volumes. One may hazard the guess that relatively few individuals in the United States will purchase these volumes at $21.50 each, and in most other countries the cost will probably appear even more prohibitive. Can the cost of future volumes be kept down to a level at which individual workers will feel able to buy them? The increased sales might then offset the lower cost per volume.

I have no intention of proving my diligence by seeking out a few errors. The sections of particular interest to me have been extremely well done, and there are no reasons for supposing that other sections are less well treated. I record with gratitude my indebtedness to the editors and their assistants for the valuable work they are doing, and I look forward to the appearance of further volumes.

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Comparative Anatomy of the Vertebrates. George C. Kent, Jr. Blakiston (McGraw-Hill), New York, 1954. xii + 530 pp. Illus. $6.

Several decades ago textbooks in comparative anatomy were almost nonexistent. The solid if stolid old Kingsley volume was breathing its last, and Miss Hyman's present excellent textbook was then merely a laboratory manual, although containing good, if brief, general discussions. In recent years this seeming sterility has changed to fecundity. No less than a dozen writers (I am one of the culprits) have spawned textbooks in the field. These volumes vary considerably in length and style of treatment, according to the desires and interests of their authors, and one or another among them will in general satisfy the needs of an instructor in a course of any type. Kent's work is the newest member of the family.

The book is relatively short (530 pp.) and is definitely designed for a one-semester course. Many of the illustrations are reproduced (as the author notes in his introduction) from the Kingsley book, and it is a pleasure to see these old but reliable friends again in modern surroundings. The treatment follows a familiar pattern. Introductory chapters treat of vertebrate characteristics, funish an account of lower chordates and of the various vertebrate groups, and give a brief introduction to embryology (94 pp.). The remaining 400 pages give, seriatim, an account of the various organ systems. Like the present reviewer, Kent is fond of bones, and devotes 30 percent of his space to the skeleton. May I warn you, Sir, that because of this you are going to receive complaints from people whose tastes run more to viscera than to osteology. I've received plenty of them myself, although devoting a rather smaller percentage of text to the skeleton.

All in all, this is a compact, well-written, and well-illustrated account of vertebrate anatomy which should find a useful place in the family of textbooks in the field. Welcome, brother!

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Reviews of Research on Problems of Utilization of Saline Water. Arid Zone Programme, No. IV. UNESCO, Paris, 1954. (Order from Columbia University Press, New York.) 96 pp. Illus. Paper, $1.75.

This collection of three papers is the fourth in a series under UNESCO's Arid Zone Programme which since 1951 has been dealing with the various problems of arid regions. The bulletin reviews research in two aspects of saline water, that is, the use of saline water for irrigation, and methods for converting saline water into fresh water.

The agricultural problems resulting from the use of saline waters for irrigation are discussed by two competent authorities. Research in Europe, Africa, and the Middle East is covered by Georges Grillot, head of the Service de la Recherche Agronomique in Morocco. His paper is entitled "The biological and agricultural problems presented by plants tolerant of saline or brackish water and the employment of such water for irrigation." Work carried out in the Americas, Australia, and India is reviewed by H. E. Hayward, director of the U.S. Salinity Laboratory, Riverside, California, in "Plant growth under saline conditions." These two papers summarize a vast amount of knowledge on the effects of various salts on plant life, and on the specific water quality requirements of certain plants.

In a paper entitled "Utilization of sea water," Everett D. Howe, associate dean of the Faculty of Engineering, University of California, very ably reviews the published results of research on methods for the purification of saline water.

Each of these reviews is a thoughtful and intelligent reporting on a specific aspect of the application of saline water to man's requirements. All persons interested in this subject will find here much informative data and constructive opinions. Of particular interest and value are the well selected and organized bibliographies prepared by the three authors.

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