All three sections of the work are fully indexed, and that to *Species Plantarum* itself is made additionally useful by the indication of the species which have been proposed as generic types.

No systematic botanist should be without this facsimile, even though he be the fortunate possessor of the original work. T. G. TUTIN

PROGRESS IN BIOCHEMISTRY

Annual Review of Biochemistry

Vol. 30. Edited by J. Murray Luck, in association with Frank W. Allen and Gordon Mackinney. Pp. viii + 758. (Palo Alto, Calif.: Annual Reviews, Inc., 1961.) 7 dollars.

WHEN, thirty years ago, Prof. J. Murray Luck and his three advisory colleagues wrote their preface to the first volume of the *Annual Review of Biochemistry*, they offered an apology for starting a new publication. They need not have apologized, for they were launching what has proved to be one of the most important publications in biochemistry; moreover, they were setting the pattern for the various 'annual reviews' in other biological subjects which were to come from California. The parent *Review* has now reached its thirtieth volume, still under the editorship of Prof. Luck. His thirty-year record of service to biochemical literature certainly deserves special mention and thanks.

The introductory chapter in the present volume was written by Prof. J. H. Northrop, pioneer in crystallization of enzymes. He likens present-day discussions on the nature of viruses to those which were taking place on enzymes fifty years ago. Perhaps his general theme may be summed up by quoting the following provocative sentence: "chemists (and physicists) have great respect for the Reverend Occam's razor and endeavour to limit their assumptions to the minimal number essential for an explanation, in accordance with the principle of the conservation of hypotheses; whereas some biologists have no respect for the Reverend's weapon and fearlessly bolster an ailing (and unnecessary) assumption by another similar one". This chapter is followed by articles on the subjects which are usually covered year by year: biological oxidation, chemistry and metabolism of carbohydrates, fats and proteins, biochemistry of muscle, vitamins and so on. Indeed, many of the chapter headings are the same as those in Volume 1 of this *Review*, and it is interesting and impressive to compare the contents of corresponding chapters thirty years apart. The present volume includes a well-illustrated article on X-ray studies of biological compounds (A. Rich and D. W. Green), and chapters on protein synthesis (P. Berg), nucleotides (A. M. Michelson), nucleic acid biosynthesis (R. Abrams), and on the polyamines spermidine and spermine (H. Tabor, C. W. Tabor and S. M. Rosenthal). The final three chapters deal with the biochemistry of (1) cultured mammalian cells (L. Levintow and H. Eagle), (2) genetic factors (C. Levinthal and P. F. Davison) and (3) the dividing cell (D. Mazia).

The editorial committee has followed the recommendation of the Commission on Enzymes in adopting the coenzyme abbreviations NAD and NADP. This, presumably, will finally seal the fate of DPN and TPN and, incidentally, provide an excuse for a new edition of almost every text-book of biochemistry. Articles on biochemistry in the U.S.S.R. appeared in Volumes 26–28; there have been none since, though there are occasional references to Russian work in the general articles in the present volume. A third decennial subject and author index would normally now be due, but according to the preface of Vol. 29 this will not be published. In view of the usefulness of the separate cumulative indexes covering Volumes 1–20, this decision seems a pity. Biochemists owe a debt of gratitude to the 38 authors from seven countries who have contributed to this volume. To write one of these chapters is no light undertaking.

D. C. HARRISON

SOIL ORGANIC MATTER

Soil Organic Matter

Its Nature, Its Role in Soil Formation and in Soil Fertility. By M. M. Kononova. Translated from the Russian by Dr. T. Z. Nowakowski and G. A. Greenwood. Pp. 450. (London and New York: Pergamon Press, 1961.) 80*s*. net.

THIS book was first published in Russian by the Academy of Sciences of the U.S.S.R. in 1951, but this recent English translation has been revised and brought up to date by the author. The last comprehensive review in English of this subject was the familiar work of Waksman, published twenty-four years ago, and so Mme. Kononova's book is a welcome addition on two accounts: it brings together many of the recent advances which have been made towards the elucidation of the chemical nature and role of soil organic matter, but, perhaps more important still, it provides a full account of the work of the Russian scientists in this field, most of which has not been available in English before.

The first chapter is devoted to a historical account of the development of the subject from the beginning of the eighteenth century and provides a valuable and interesting sidelight on the divergence of ideas relating to the chemical nature of humus. Earlier British and American workers suggested that because of the relative resistance of plant lignin to microbial decomposition, it must be a major component, in a modified form, of humus. On the other hand, Russian and German workers believe that humus is a product of microbial synthesis, plant materials merely acting as a substrate for the micro-organisms. The author then elaborates on the theory that humus is a mixture of heterogeneous polymers produced by random condensation of polyphenols and amino-acids, both products of microbial decomposition, in the presence of oxidizing enzymes. The heterogeneous nature of the polymers is claimed to explain their resistance to microbial decomposition. A great deal of evidence is provided to support this theory, much of it having been obtained by Mme. Kononova and her colleagues at the Dokuchaev Institute.

A discussion follows on the role of soil organic matter in soil fertility and soil formation in the light of this theory. Unfortunately, the section on fertility only touches on nitrification with scarcely a mention of organic phosphorus and sulphur compounds. Its role in soil formation and the changes brought about by different types of cultivation are reviewed at length. Methods of maintaining the levels of organic matter in soils are dealt with, including the rotation theory of V. R. Williams, which is receiving

a good deal of attention in the U.S.S.R. to-day. The section on soil formation is placed in perspective by a final short chapter contributed by N. N. Rozov on the major soil types of the U.S.S.R.

Analytical methods are confined to an appendix, thus making for easier reading, and here mention should be made of the excellent work of the translators. It is a pity that the quality of the book has been lowered by the use of inferior quality ink, but on the credit side the value of the book has been enhanced by an offer from Pergamon Press to supply readers with a translation of any article referred to in the text, at a reasonable price.

J. W. Parsons

YOUTH SCIENCE ENCYCLOPÆDIA

Junior Science Encyclopaedia

Consultant Editorial Board: Dr. Maurice Burton, Prof. J. M. Cassels, Sir James Chadwick, Sir John Cockcroft, Prof. L. Dudley Stamp, Prof. F. G. Young, and Prof. J. Z. Young. General Editor: Leslie Basford. Vol. 1: Pp. 1–88. Vol. 2: Pp. 89–176. Vol. 3: Pp. 177–264. Vol. 4: Pp. 265–352. Vol. 5: Pp. 353–440. Vol. 6: Pp. 441–528. Vol. 7: Pp. 529–616. Vol. 8: Pp. 617–703. (London: Sampson Low, Marston and Co., Ltd., 1961.) 104*s*. the set, or 13*s*. each volume.

WE are unquestionably living in the golden age of science, at a time when the sciences, the scientists, and their promoters have 'never had it so good'. Since the turn of the century, science has risen to a position of such great political, social, and technological significance that it now seems unnecessary even to apologize for rockets and capsules to the moon, or laboratories and equipment in the schools, or reactors and refineries on the sea-shore. We are also growing accustomed to the ever-increasing number of scientific books which purport to satisfy a long-felt need, or offer no apology for their appearance at all.

Junior Science Encyclopaedia is one such set of books which has appeared on the market without a preface. However, the general editor, Mr. Leslie Basford, does supply on the cover and the title-page of every volume the names of the eminent scientists who form the consultant editorial board. Sir Lawrence Bragg and six of the consultant board have contributed short introductions to the study of physics, zoology, science, electronics, geology, biochemistry and anatomy. These introductions are arbitrarily allotted one to each of Volumes 2–8. I found myself wondering why Prof. Cassels did not contribute an article, and why Sir John Cockcroft did not autograph his contribution. Volume 1 contains, of course, a short introduction to the consultant editorial board.

The reader, therefore, is left to judge for himself the aim and scope of this set of books. This is by no means an easy task. To begin with, the title is somewhat misleading. The word "Junior" usually relates to children of not much more than twelve years of age. However, these volumes have little to offer such children apart from the glossy, attractive covers, and the exaggerated use of vivid colours: the only things in black and white are a few photographs (including those of the above-mentioned scientists) and most of the print. Furthermore, the term "Science Encyclopædia" rather implies a wealth of scientific information for both the young and the old. However, the cover illustrations and the presentation of the material indicate clearly that these volumes are not primarily designed for the adult. It would appear, therefore, that they are intended for children in their early teens.

The topics range widely from absolute temperature to calorimeters (Volume 1), Cambrian period to Doppler effect (Volume 2), double stars to graphs (Volume 3), gravitation to loglines (Volume 4), longitude to petrified forests (Volume 5), petroleum to satellites (Volume 6), saturation to triple-expansion steam engines (Volume 7), and tropical medicine to zoology (Volume 8). The last volume also contains an index with ample cross-references to related topics, short articles on subjects of recent scientific research and on scientific method, a supplementary glossary of scientific terms, and forty-eight charts of the night sky. There is a superabundance of illustrations which are invariably highly coloured. Some of these, such as the domestic electricity meter on p. 194, the camera lens on p. 336, and the guns on pp. 269–270, are quite impressive. However, many, such as the amphibians on p. 19, the distillation apparatus on p. 172, and the minerals on p. 381, are very poor: this is the result of rather inferior colour printing and inaccurate draughtsmanship.

Since Sir James Chadwick ends his introduction to the study of science with the comment that "there is some relief to be found in the fact that it is now easier than it was to have access to reliable sources of information", there seems to be the suggestion that these books are reliable sources of scientific information. The editor must, of course, omit much of interest and importance. He must also omit unnecessary complications and admit convenient simplifications. He must then run the risk of creating a false impression and of publishing a less-reliable source of information. A most surprising omission from the list of 116 famous scientists (pp. 532–540) is the name of John Dalton, 'founder' of the atomic theory.

On pp. 45–46, the relative sizes of the atoms are indicated by spheres in an assortment of colours from yellow and green to mauve and chocolate-brown. These colours are of little significance since a different set of coloured spheres is used on p. 111 to represent 'molecules' of sodium chloride and other well-known ionic compounds. These illustrations are fortunately small. The calcium carbonate 'molecule' also appears on p. 388. This time, for no apparent reason, it is inverted and occupies half the page. In both these illustrations the relative sizes of the atoms are preserved and the links between them are in accord with their valencies. Unfortunately, it is well established that all three oxygen atoms are attached to the carbon atom. The linking between oxygen atoms represented by these illustrations probably occurs only in ozone and ozonides.

Certain small errors were also noticeable to me. For example, chemists rarely ever do acid-base titrations using litmus indicator (p. 21), a colloidal solution is called a 'sol' and not a 'soll' (p. 131), the illustration of the structure of graphite is slightly inaccurate (p. 155), and 'allotrope' rather than 'allotropy' is intended in the glossary of terms (p. 696).

The overall impression of this set of books is likely to be that they have something of interest to offer the budding young scientists, but that they are too expensive at 104*s*.

Michael C. Cox