

mostly grouped around the equivalence of mass and energy, are then considered. The setting up of the theory is taken up again in the later part of the book in terms of the perception of distant events by means of light signals (the so-called radar method or *k*-calculus). This enables him to discuss the clock paradox in a very clear manner. There is an appendix on physics and perception in which the author tries to extend to large areas of everyday life the general ideas (as opposed to specific mathematical concepts) that arise in special relativity. In some ways this part of the book is less satisfactory because less complete than the rest. In other ways it is the most interesting part because we see here a noted scientist trying to use the knowledge which he has acquired in his professional capacity to make sense of the whole world around him. The experience is a very exhilarating one.

C. W. KILMISTER

International Directory of Isotopes

Third edition. Pp. 487. (Vienna: International Atomic Energy Agency; London: H.M.S.O., 1964.) 54s.; 9.00 dollars.

THIS new edition of the International Atomic Energy Agency's *International Directory of Isotopes* is arranged in five main sections:

(1) An introductory section explaining its purpose and layout, and giving the essential information about 83 isotope suppliers (address and short description of materials and services offered). Reactor centres which will carry out irradiations are tabulated separately against their maximum neutron fluxes.

(2) An alphabetical list of 186 radioisotopes, showing which suppliers offer them and in what form. This section has more than 3,000 entries. A summary of the radioactive properties of each isotope is given (boxed so that it stands out on the page) and the various compounds, standard solutions, radiation sources, and so on are listed. Brief specifications (specific activity, dimensions) are given, but prices are not.

(3) A list of 250 separated stable isotopes, showing the degree of enrichment and quantity available from stock. There are only three primary suppliers—Harwell, Oak Ridge, and the Soviet export organization Soyuzchimexport—but several firms offer stable isotopes in the form of Mössbauer absorbers or labelled compounds.

(4) Compounds labelled with the radioisotopes carbon-14, tritium, iodine-125, iodine-131, phosphorus-32 and sulphur-35. Compounds of other radioisotopes are included in Section 2. The supplier and specific activity (in mc./m.mole) are given. There are nearly 1,800 compounds labelled with carbon-14 and 650 with tritium.

(5) Compounds labelled with the stable isotopes carbon-13, deuterium, nitrogen-15 and oxygen-18. The 100 compounds labelled with nitrogen-15 and the 40 labelled with oxygen-18 are of special interest as neither element has a long-lived radioisotope.

With this arrangement, the *Directory* admirably fulfils its purpose, to guide the research worker to the supply organization most likely to have the isotopic material he wants. It contains less detailed information than its predecessors, but it has many more entries. It will be useful for two or three years—after which it is to be hoped that the Agency will revise it again.

C. B. G. TAYLOR

Elements of Chemistry

By Antoine-Laurent Lavoisier. Translated by Robert Kerr. Introduction by D. McKie. Pp. xxxi + 1 + 511 + 13 plates. (New York: Dover Publications, Inc.; London: Constable and Co., Ltd., 1965.) 3 dollars; 24s.

DOVER Publications, Inc., have published a facsimile reprint of *The Elements of Chemistry*. This is the translation by Robert Kerr, published in 1790, of Lavoisier's

famous *Traité élémentaire de Chimie*. It is unfortunate that the excellent introduction by Prof. D. McKie is limited to only 26 pages. Prof. McKie, an eminent historian of science and authority on Lavoisier, gives a fascinating account of the state of knowledge in chemistry when Lavoisier embarked on his researches, and provides many illuminating comments on Lavoisier's work which fully justify the statement that Lavoisier was the founder of modern chemistry, with the *Traité* as its first textbook.

The *Traité* itself contains the first explicit statement of the law of conservation of matter in chemical changes, the first modern list of the chemical elements, an account of the calorimetric experiments which were the foundation of thermochemistry, and an account and illustration of the apparatus used by Lavoisier in his famous experiments on the composition of the atmosphere in which he heated mercury in a confined volume of air. The illustrations in the *Traité* (there are 13 plates excellently reproduced) were from drawings by Lavoisier's wife (whom Lavoisier married in 1771 when she was aged nearly fourteen, and who later married Count Rumford).

Although a paper-back edition, the book is well printed on good quality paper and is sewn not glued.

Anyone interested in the history of science will welcome this opportunity of obtaining Lavoisier's classic. To anyone not interested, I challenge them to read Prof. McKie's introduction and remain uninterested.

ROGER PARTINGTON

Nucleotides and Coenzymes

By Dr. D. W. Hutchinson. (Methuen's Monographs on Biological Subjects.) Pp. viii + 136. (London: Methuen and Co., Ltd.; New York: John Wiley and Sons, Inc., 1964.) 18s. net.

THIS addition to the Methuen monographs is very timely. It deals with matters which are central to the whole of biochemistry. Dr. Hutchinson has succeeded in encompassing the large field of nucleotide chemistry succinctly but in sufficient detail to convey the real chemistry underlying the complex molecules that come under his survey. How different this is from the situation to be found in so many larger text-books of chemistry and biochemistry. There, the structures alone of the nucleic acids, the nucleotide coenzymes and the many other classes of natural phosphate esters are considered to be sufficient for the student's understanding of their function. In this respect one suspects that this monograph will have a much wider appeal than to the undergraduate and research student body to whom it is primarily directed.

Beginning with the nucleosides and mononucleotides, the subject is developed through the nucleotide coenzymes, including those derived from thiamine and pyridoxal, to the oligo- and poly-nucleotides. At each stage the chemical and biochemical synthesis is considered, as is the function of the compound under consideration. The section dealing with the polynucleotides is short but, in the circumstances, adequate, as the book is designed as a companion to the well-established monograph on the nucleic acids by J. N. Davidson. The bibliography is well chosen to lead the student more deeply into the subject.

D. M. BROWN

Dictionary of Nutrition and Food Technology

By Dr. Arnold E. Bender. Second edition. Pp. viii + 221. (London: Butterworth and Co. (Publishers), Ltd., 1965.) 47s. 6d.

THE second edition of this useful reference book provides a greatly increased collection of information. The sources of information are extended and Dr. Bender's wide knowledge of the science of nutrition and the application of nutrition to food technology allows him to give due attention to many aspects of the subject.