

new to many readers. Soil conservation activities in the United States have raised the consumption of liming materials from 3.3 million tons a year in 1935 to 13.1 million tons in 1940 and 26.5 million tons in 1950. Prior to 1900, organic manures supplied more than 90 per cent of the nitrogen added to the soil; since 1950 they have supplied less than 4 per cent, the rest being from chemical fertilizers. These supply more than a million tons of nitrogen a year, much of it in the form of ammonium sulphate, but a large and increasing use is made of free ammonia, for which special appliances have been designed. Slow-acting nitrogenous fertilizers based on urea are coming into use, and promise to solve some of the grower's difficulties; it is interesting to note that for this purpose urea has to be imported. As in the United Kingdom, American farmers show a decided preference for mixed fertilizers over single ones; the general formula has changed in the same direction: prior to 1915 the ratio $N : P_2O_5 : K_2O$ was 1 : 4 : 1; it is now approximately 1 : $2\frac{1}{2}$: 2. There is a tendency also to use more concentrated fertilizer, but granulation is not as usual as in Britain. A very informative chapter on pest control agents includes some pages of constitutional formulæ of the more common organic substances used for this purpose and made on an increasingly large scale—a triumph of modern chemical technology. The need for these control agents is growing: the damage done annually in the United States by insects is roughly estimated at 4 thousand million dollars, by plant diseases at 3 thousand million dollars, and by weeds at more than is done by insects and all plant and animal diseases put together. The authors state that the apple grower "has to compete with 200 infectious diseases and 100 insect pests in order to produce a marketable crop"; it is not surprising the United States Department of Agriculture has a list of thirty thousand pesticidal formulations.

Most of the book is occupied by the processing, storage, packing and transport of foods; these chapters are a rich mine of interesting and sometimes intriguing information. Wheat is made into a number of different foods, in all of which it can be recognized. But maize can be used in making a surprising number of products of the most diverse character: foods for man and beast, antibiotics, cosmetics, chewing gum, explosives, rayon, tobacco, paper, soap, ice cream and various other things. The book ends with some useful chapters dealing respectively with control of quality in food, the disposal of food-plant wastes, and the use of chemicals in food. Altogether, it is an interesting volume.

But it is dear. Its price in Britain is £5—a reflexion, no doubt, of the high cost of production in the United States, but all the same hard on a British buyer.

E. JOHN RUSSELL

THE EXTRA PHARMACOPŒIA

The Extra Pharmacopœia (Martindale)
Vol. 2. Twenty-third Edition in two volumes. Pp. xxxi+1501. (London: Pharmaceutical Press, 1955.) 57s. 6d.

THIS book, which is the latest reincarnation of the second volume of the famous work by Martindale and Westcott, contains a large amount of compact information. The two volumes of the

twenty-third edition together contain more than 2,850 pages. The first edition was published in 1883 and contained only 313 pages, and the book grew slowly at first and then rapidly between 1900 and 1910. Since then it has grown at a fairly steady rate, but the interval between editions has increased from two years up to eleven or twelve, so that the amount of matter added with each edition has increased. It is a pity that the interval has grown so long, but the labour involved must be enormous.

In this Vol. 2 about 450 pages are devoted to analytical addenda to Vol. 1—the methods by which the pharmacists ensure that the drugs we use contain the proper ingredients and nothing more. Sections are devoted to pH, oxidation potentials, polarography, indicators, ion-exchange resins, chromatography, spectrophotometry, fluorimetry, the microbiological assay of vitamins, food analysis, water analysis, sterilization, disinfectants, radiotherapy, electrotherapy, nutrition, hæmatology, clinical biochemistry and various other topics which come within the wide range of subjects which the pharmacist understands.

The section on the nomenclature of organic compounds has developed gradually through several editions, and will now be very valuable to those who have to try to understand organic structures without being organic chemists. It is a pity, however, that there seems to be no clue to the meanings of the prefixes such as *cis* and *meso* mentioned on p. 768, and surely *nor* means "N ohne radikal" and not "the next lower homologue".

There is a stimulating section on what the Americans call SAR (structure action relationships), but sulphanilamide was not the first useful drug the action of which was traced to its close resemblance to a natural metabolite (p. 780). The theory that some drugs act in this way had been widely discussed in connexion with eserine, atropine, ephedrine and other drugs for many years before it was applied to sulphanilamide.

Enough has perhaps been said in this review to show that the book not only gives much information, but also provokes thought. It is a worthy successor to a long line of famous forerunners.

J. H. GADDUM

ANTHROPOMETRY AND HUMAN ENGINEERING

Anthropometry and Human Engineering

A Symposium on Anthropometry, Human Engineering and Related Subjects conducted by the AGARD Aeromedical Panel on 3 and 4 May 1954 in Scheveningen, The Netherlands. (AGARDograph No. 5.) Pp. iv+123+3 plates. (London: Butterworths Scientific Publications, 1955; published for A.G.A.R.D.) 21s.; 3 dollars.

THIS publication originated from a symposium conducted by the Aeromedical Panel of the Advisory Group for Aeronautical Research and Development, North Atlantic Treaty Organization, and shows a well-defined grouping of related papers. The various approaches by the different authors add considerable interest to what could be a heavy subject. Its scope is wide, and it should be of interest to the aeronautical engineer and applied psychologist. Indeed, the latter may be impressed by the scope and importance of the work in his field introduced in this