

Portuguese Trade in 1919.—Although the export trade in 1919 increased but slightly, the value of the imports more than doubled, owing to diminished production, the introduction of the 8-hour day, and the need for replenishing stocks. Business, generally, was prosperous, coal again became available, and the cork industry had a good season.

The imports, valued at £38,600,500 (escudo = 3s. 4d. at par), included:—Cement, 12,155 metric tons; sodium borate, 44 t.; sodium carbonate, 1289 t.; sodium sulphate, 280 t.; caustic alkali, 2423 t.; carbonate of calcium, 1233 t.; chlorate of calcium, 1038 t.; nitrate of potash, 142 t.; nitrate of soda, 218 t.; quinino salts, 70 t.; copper sulphate, 2043 t.; other chemicals and drugs, 4844 t.; coal, coke, etc., 609,363 t.; dyes and colours, 851 t.; dyeing extracts, 947 t.; dyewoods, 165 t.; fertilisers, 23,292 t.; oils and fats, animal, 1272 t.; palm oil, 1532 t.; other oils, 322 t.; perfumery, 74 t.; and sulphur, 6305 t. The greater part of the chemical imports is supplied by England.

Among the exports, the par value of which was £18,425,666, were:—Argols, 11,666 metric tons; chemical products, 1526 t.; cork and cork products, 71,223 t.; hides, 1612 t.; cod oil, 524 t.; mineral oil, 569 t.; olive oil, 720,360 litres; copper ore, 18,403 t.; iron ore, 7375; wolfram, 770 t.; other ores, 1101 t.; paper pulp, 858 t.; rosin, 1661 t.; turpentine, 370 t.; wax, raw, 112 t.; vinegar, 320,610 litres; glassware, 365 t.; and soap, 189 t.—(*U.S. Com. Rep.*, Nov. 3, 1920.)

GOVERNMENT ORDERS AND NOTICES.

PROHIBITED EXPORTS.—The following have been removed from lists "A" and "B" of prohibited exports as from February 1:—(1) Coal tar, all products and derivatives thereof, whether actually so obtained or so derived from other sources (including all mixtures and preparations containing such products and derivatives), suitable for use in the manufacture of dyes or explosives; (2) dyes and dyestuffs manufactured from coal-tar products and articles containing such dyes and dyestuffs; and (3) indigo, synthetic.

Yeast was removed from the same lists on January 13.

DECONTROL OF COAL.—The Directions of the Board of Trade, dated August 25, 1920, regarding pithead prices of coal, are to be cancelled as from March 1 next, as there is now no danger of shortage within the country, and the export price has approached the home price so closely that there is no longer any reason for restricting prices. Further, the directions for the supply of specified districts or consumers, will cease to have effect from the same date, and inland consumers will then be free to purchase from any source. The position as to the supply of coal for foreign bunkers and export remains as published in the *Journal of the Board of Trade* for December 28, 1920, and January 10, 1921.

FIRE PREVENTION.—A Royal Commission has been appointed to inquire into the existing provision for the avoidance and extinction of fires.

MINERS' LAMPS COMMITTEE.—The Secretary for Mines has reappointed, with extended terms of reference, the Miners' Lamps Committee which was appointed by the Home Secretary in May, 1919. The Committee has to report upon possible improvements in the safety and illuminating power of miners' lamps, testing methods, maintenance of the lamps, use in mines which show no indication of inflammable noxious gases, etc. Mr. W. Walker, of the Mines Department, is chairman, and Prof. R. V. Wheeler is a member of the Committee.

REVIEWS.

NUCLEIC ACIDS: THEIR CHEMICAL PROPERTIES AND PHYSIOLOGICAL CONDUCT. By WALTER JONES. Second edition. Pp. viii. + 150. (London: Longmans, Green and Co. 1920.) Price 9s. net.

As the science of biochemistry advances the problem of the nature of the substances most intimately connected with the living cell—which constitute, as it were, the chemical basis of life—is being gradually unravelled and the substances themselves isolated and relegated to their proper position in chemical classification. Within comparatively recent years the sugars, the purines, the proteins, and the lipins have yielded many, though by no means all, of their secrets to the investigator, and some beginning has been made in the study of their functions in the living organism. In the present work an account is given of the elucidation of the chemical nature of another group of substances of great physiological interest—the nucleic acids. The fundamental importance of the nucleus in all the physiological relations of the cell has long been recognised by biologists and renders the story of the discovery of the chemical nature of the nuclear constituents, as told in the first half of Prof. Jones's book, one of intense interest and fascination. The nucleic acids occur in the cell nuclei combined either with proteins, as *α-nucleoproteins*, or with the much simpler protamines, in which form they are present, for example, in the spermatozoa of fish. The *α-nucleoproteins* consist most probably of various salts of protein with nucleic acid, in which the protein is in excess. When they are digested with pepsin part of the protein is digested away, leaving a mixture of more acid salts, indefinitely called *nuclein*. To use the term introduced by Kossel, the nucleic acids form the prosthetic group of the *α-nucleoproteins* and nucleins.

Many chemists have contributed to the discovery of the constitution of the nucleic acids, prominent among whom are Kossel, Levene, and Jones, the author of the present work. So far as is known only two nucleic acids exist: that prepared from the cells of animals, generally known as thymus nucleic acid; and that obtained from vegetable cells, usually termed yeast nucleic acid. These two agree in their general structure but differ in the nature of their components and to some extent in their behaviour towards reagents. Yeast nucleic acid, the better known of the two, is resolved by mild alkaline hydrolysis into four groups, known as *nucleotides*, each of which is a compound of phosphoric acid, *D*-ribose and a base, probably combined in that order. Two of these bases are purines, guanine and adenine; the other two pyrimidines, cytosine and uracil. These nucleotides are themselves decomposed by further hydrolysis with loss of phosphoric acid and formation of *nucleosides*, each composed of *D*-ribose and the corresponding base:—

	<i>Nucleotides.</i>	<i>Nucleosides.</i>
Yeast nucleic acid →	Guanine nucleotide	→ Guanosine
	Adenine "	→ Adenosine
	Cytosine "	→ Cytidine
	Uracil "	→ Uridine

The exact mode of combination of the various components within the nucleotides and of the nucleotides with each other is not yet definitely settled.

Thymus nucleic acid is probably constituted after a similar plan, but the sugar group is a hexose, and the four bases are guanine, adenine, cytosine, and thymine.

The second part of the book is devoted to the no less fascinating story of the physiological conduct

of the nucleic acids, which affords an admirable example of the remarkable complexity of chemical changes in the living organism as well as of the extraordinarily specific adaptation of its enzymes to the materials upon which they have to exert their action. Briefly put, nucleic acid is first decomposed into its constituent nucleotides by means of a *nucleinase*, present in the intestinal juice. The nucleotides thus liberated may undergo decomposition in either of two ways. First, by the action of a *phospho-nuclease*, they may yield phosphoric acid and the corresponding nucleoside. This is the only change observed with the two pyrimidine nucleotides, and the fate of the resulting pyrimidine nucleosides is not fully understood. The purine nucleotides, however, may also be acted on by a *purine-nuclease*, yielding a purine and a carbohydrate phosphoric ester. The purine nucleosides may also be directly hydrolysed, by a *nucleosidase*, to purine and carbohydrate. Here, however, a further complication arises, for the purine bases themselves and the purine nucleosides may be deaminised (by specific enzyme action), guanine yielding xanthine, and adenine, hypoxanthine, whilst the two nucleosides undergo a similar change, forming new nucleosides, which on hydrolysis (again by enzyme action) yield xanthine and hypoxanthine. Finally, oxidising enzymes come into play, and the hypoxanthine passes first into xanthine and then into uric acid. Here in man and the higher apes the process stops and the uric acid is excreted, or lurks in the system to cause those ills which are the penalty of our evolutionary superiority. In the lower mammals, including the monkey, the uric acid is almost completely oxidised to allantoin, which is excreted.

To the biochemist this book cannot fail to be of profound interest, alike for the importance of the matter and the lucidity of the exposition. Appendices concerning practical methods and a bibliography of over five hundred papers add to its usefulness.

A. HARDEN.

DIE ZWISCHENPRODUKTE DER TEERFARBENFABRIKATION. By OTTO LANGE. Pp. xxiv. + 645. (Leipzig: Otto Spamer, 1920.) Prices:—Unbound, Germany, 135 marks plus 40%; England and Colonies, 80s.

Closely bound up with the vitally important problem of developing our industry in fine chemicals, including the coal-tar intermediates, is the question of the provision of a technical literature of an informative character. Although the production of such treatises is more prevalent now than formerly in this country, English-speaking chemists are still largely dependent on German text-books for the detailed information which is essential to a working specialist in any of the main branches of chemical technology.

The appearance of the volume under review is one of many evident signs that this hegemony in chemical literature will not be easily surrendered, for whatever developments the future may bring, it is an indisputable fact that the published records of progress achieved in coal-tar chemistry during the past two or three decades are to be found largely in German patent specifications.

The author introduces his subject by laying stress on the circumstances that the coal-tar intermediates constitute the basis of the synthetic colour industry, and the task he has set himself is to present within moderate compass, in tabular form, an epitome of this very large group of chemical substances. The dimensions of the work may be gauged by noting that this tabulation contains 3637 entries; but these represent a far greater number of compounds, for in numerous instances the entry is generic and contains references to many chemical entities. The treatise is in the first instance divided into four

principal sections under the headings of benzene, naphthalene, anthracene, and phenanthrene, and in each of these sections the derivatives of the parent hydrocarbon are arranged in increasing order of complexity. The introduction and summary of contents furnish an explanation of the system of arrangement whereby it is easy to find the reference to any desired intermediate. Each reference contains a characteristic number by means of which the intermediate or group of intermediates can be located on looking up the comprehensive index. The patent is cited in which the given intermediate was first described, and this quotation is followed by a concise summary of the method of preparation.

In the vast majority of cases references are given only to German patents, but occasionally English, French, and American specifications are quoted, but only as subsidiary citations. In many instances this information is supplemented by references to German scientific journals. Providing that the reader has access to the principal German patents on coal-tar intermediates, such as those reproduced in Friedländer's comprehensive treatises on the progress of the coal-tar industry, then the problem of tracking down any particular intermediate will be greatly facilitated. From the number of entries it is obvious that a very large number of intermediates are tabulated, but at the same time many substances of purely scientific interest are omitted, since these can be found by reference to the lexicons of Richter or Stelzner. Considerable space is saved by omitting all names of authors or patentees. On the other hand, the parts by weight of the reagents, the physical constants (melting and boiling points) of the products, and other experimental details are indicated whenever these are likely to be of practical utility.

Cross references are furnished by the addition of lists of the German provisional and complete specifications (Anmeldungen and D.-R.P.), so that when a patent number is known the compound or compounds described in the specification can be identified.

The text is remarkably free from typographical errors and other inaccuracies, and the entire treatise is a simple guide to the more detailed information scattered through German patent literature.

G. T. MORGAN.

BENZOL: ITS RECOVERY, RECTIFICATION, AND USES. By S. E. WHITEHEAD. With an introductory note by the Rt. Hon. Lord Moulton. Pp. xiv. + 209. (London: Benn Bros., Ltd. 1920.) Price 12s 6d net.

Although the recovery of benzene and its homologues from the coal gas produced in coke ovens has been practised on the large scale for many years, the literature on the subject is very scattered and incomplete. The demand arising out of the war for the maximum production of benzene and toluene as the main raw material for high explosives, rendered necessary the equipment not only of all coke-oven installations with "benzol" plant, but also, as far as practicable, the adoption of the process in gas works; and in carrying out this work the want of a book dealing with the subject was seriously felt. This want still continues in spite of the decreased requirements for explosives, as the combined demand for these hydrocarbons in the organic chemical industry and as motor spirit is far in excess of the supply.

Mr. Whitehead's book is designed to fill the gap and to incorporate the results of the author's experience on the technical staff of the Department of Explosives Supply during the war, with a very large number of installations of "benzol" plant, varying from fully equipped large-scale plants to small emergency plants often constructed largely