and this will appeal to the student of chemistry and broaden his outlook on the subject. The volume begins with a chapter on the photosynthesis of plant products followed by chapters on chlorophyll and other natural pigments, the carbohydrates, tannins, oils, fats, waxes, terpenes, amino-acids, natural bases and the alkaloids, a selected list of references being given at the end of each chapter.

The chapter on carbohydrates especially leaves room for much improvement, and the 42 pages devoted to this chapter might with advantage have been more than doubled, considering the size of the book. The suffix "-oses" for the different groups of carbohydrates "monosaccharoses," "disaccharoses," etc., used by the author instead of "-ide" should be dropped, as it is now out-of-date and, moreover, it implies a free reducing group in the compound. Under the degradation of a hexose into a pentose by different chemical methods on pp. 45-6, allusion might have been made to the fact that by none of these methods have we been able to imitate the degradation of hexoses as takes place in nature—viz., dextrose to xylose and galactose to arabinose. The space devoted to enzymes here and there in the book is disappointing and the subject ought to be treated at length in a separate chapter, but one supposes these chemical reagents of the cell to be beneath the notice of the organic chemist of to-day since "they are not crystalline entities." The section in this chapter on polysaccharides contains six pages, covering cellulose, starch, inulin, etc., and deals principally with the results of methylation of these polysaccharides, the work done on the Continent being omitted altogether. Glycogen and inulin are only alluded to in a few lines, whilst gums, galactans, amylans, pectins, lichenins, hemicelluloses, oxy-celluloses, hydrocellulose, lignin and cycloses find no mention.

Dealing with Dakin's process for the separation of amino acids on p. 143, it should be made clear that an efficient extraction is only possible when the aqueous phase does not contain an excess of mineral salts, and hence the use of mineral acids other than sulphuric acid is precluded. In this connexion the promising carbamate method of Schryver and his co-workers deserves mention.

In the chapter on natural bases there is a misstatement on p. 174, common to other books on the subject, that hordenine is obtained from an infusion of barley germs. In reality barley germs—by which we commonly mean the embryo of the grain—do not yield as much hordenine as is present in the rootlets produced during germination. The statement is made on p. 176 that lævo-adrenaline has many times the pressor effect of the dextro-adrenaline, but it has been shown conclusively that the *d*-antipode, when properly prepared, free from traces of other impurities, approximates in its pressor effect to that of *l*-adrenaline.

The formula given on p. 191 for the structure of yeast nucleic acid is incorrect, as it has been proved beyond doubt by Jones and his co-workers that the nucleotides are linked not through their phosphoric acid residues but through their carbohydrate constituent. A few mistakes in the spelling of names have crept in, *e.g.*, Schenck for Schunck on p. 13, Proctor and Frendenburg for Procter and Freudenberg on p. 85.

Apart from these defects the book is singularly free from printing errors. The author is to be congratulated for having produced a work free from cumbersome details in which he has departed from the usual text-book treatment, and which is destined to receive wide appreciation. Books covering such ground are rare and are badly wanted in English scientific literature.

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FUEL, SOLID, LIQUID AND GASEOUS. By J. S. S. BRAME. Third edition. Pp. xv+388. London: Edward Arnold and Co., 1924. Price. 18s.

In the preface to the first edition of this book it was stated that the author's endeavour was "to place before the technical man who is not a fuel specialist, but who requires a good general knowledge of the subject, as full information in all fuels as space permits." The fact that Brame's "Fuel" has now reached its third edition shows that the need for such a book existed and that the endeavour to meet it has been successful. The book is divided into four sections, solid fuels, liquid fuels, gaseous fuels, and analysis, testing, and so on, and so comprehensive is the mass of information that the fuel specialist himself will have found it a useful handbook.

The present edition is the result of considerable revision to bring the book more into line with present-day requirements; indeed, one sees references to the most recent publications. In view of Prof. Brame's association with oil technology it is natural to find stress laid on liquid fuels and the most recent developments in this branch. Indeed, the section on internal combustion engines has been largely rewritten. In the analytical section prominence has been given to the recent efforts made to standardise the methods of testing mineral oils by the Fuel Research Board.

The reviewer, mindful of our indebtedness to the author of a comprehensive treatise for his labours, will or ought to be diffident about any fault-finding. The criticism which will be justifiable is one which is perhaps inevitable in dealing with books of a general character—viz., that the revision is uneven. The last ten years has wrought great changes. The author has recognised this by rewriting certain sections but has recoiled before the task in others, contenting himself with adding a few recent references where considerable pruning and rewriting would have been better. It is not that the picture painted is wrong in outline, but the colouring is faded where freshness is most desirable. This is very noticeable in the section on gaseous fuels, where it is obvious that the author is portraying conditions essentially as they were in pre-war days.

Having pointed this out, one can say in conclusion that "Brame's" will continue to be a standard general treatise on the subject, especially if the revision is intensified when the fourth edition is called for.

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