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the cane, and passing on in natural sequence to the mill, the treatment of the juice, the manufacture of the sugar, the testing of the sugar solutions, and finally to the molasses and fermentation. Throughout, the book is one for the practical man, and much important detail has been embodied within its pages. One of the best chapters is that treating of "Condition or Heart," plant food, and drainage, the first constituting, as Mr. Watts says, "a large portion of the science of agriculture." Analyses are, of course, given, but they are not asked to do duty for the whole, as is often the case in agricultural treatises. It is interesting to note, too, the remarks upon the assimilation of atmospheric nitrogen by the Leguminose, in which Mr. Watts follows Berthelot. Sehhofer and Laurenzi have, indeed, recently denied the fixation of nitrogen by the action of microbes beneath the surface of the soil, but their theory of chlorohyll action far greater proof than they have offered. Berthelot is a good leader. Chapter III. deals with the sugar cane, treating of the preparation of the land, the manner of manuring and weeding, the cutting of the cane, and the utilization of the trash. Chapter IV. is of general interest, though the facts are applied in a particular manner to sugar growing. The collection, retention, and value of pen manures, the application of green dressing and of chemical manures, including potash, phosphates, sulphates, sulphate of iron, etc., forms together an interesting study. The fallacy, which is so common, of supposed increase in manurial value of the excreta as compared with the food eaten, is here spoken of, as is also in a previous chapter the practice of burning the trash under the impression that thereby its value as a fertiliser is increased.

In the chapter dealing with the mill and the extraction of the juice, the various types of the former are compared and diagrams given. The application of hydraulic attachment to the rolls is mentioned, and a comparison is made of the results from crushing and those obtained by maceration and diffusion. The preceding chapters treat of the juice, tempering, clarifying, filtering from the scum and the utilization of the latter, the manufacture of the sugar, in open pans, with strain, and in vacuum, and finally of the testing of the solutions and syrups. The production of sugar begins with the recovery of the sugar therefrom, and finally the nature of fermentations and fermentation with the yield of alcohol and the forms of the effluents employed, constitutes the subject matter of the concluding chapters.

There are in addition tables of the temperature of steam at varying pressures, a list of the elements with their symbols and atomic weights, and a table of the densities, etc., of saccharine solutions.

We should be pleased to see this book in a second edition much enlarged and amplified, and trust that it is but the beginning of a series.

C. P.

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SIR ROBERT S. BALL, F.R.S., the well-known English astronomer, has just completed an "Atlas of Astronomy," containing numerous beautifully printed telescopic views of planets, the sun's corona, etc., and diagrams of orbits. There are many star maps, and a series of twelve plates devoted to the moon, showing its aspects on consecutive days from the third to the fourteenth, making seventy-two plates in all. An introduction of nearly sixty pages gives a comprehensive explanatory text. The Atlas is published by D. Appleton & Co.

—Bulletin No. 40 of the United States National Museum is No. IV. of the Bibliographies of American Naturalists, published by the government. This one is by L. S. Foster, and gives the writings of the ornithologist, Geo. N. Lawrence. A portrait faces the title-page, and in the course of the 124 pages 121 titles are enumerated. Under these titles are given all facts connected with them. The species given in each are enumerated, together with the locality and page. A very full index gives ready reference to any species mentioned.


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