much as to-day when their power to serve the welfare of the community has been so vastly increased and is rapidly growing, and if it wants good doctors it must help to make them.

I have been able, within the limits of this address, to indicate only a relatively small part of the increased strength gained by both medical school and university by the combination of their forces, but I hope that I may have conveyed some impression of the rich fields of discovery, of the beneficent service to the community, of the important educational work opened to the university by close union with a strong department of medicine, and of the inestimable value to medicine of intimate contact with the fructifying influences and vitalizing ideals of the university. Where is there a university which, if provided with the requisite resources, gives stronger assurance of securing these mutual benefits than the University of Chicago, so fruitful in achievement during its brief but eventful history, so vigorous in its present life, so full of high promise for the future, and where in all this land is there a location more favorable to the development of a great university medical school than here in the city of Chicago? Such a development is bound to come and the sooner it arrives the earlier the day when America shall assume that leading position in the world of medical science and art assured to her by her resources, the intelligence of her people, her rank among the nations and her high destiny.

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SCIENTIFIC BOOKS

Denatured or Industrial Alcohol. By Rufus Frost Herrick. 8vo, pp. ix + 516. 163 figures. New York, John Wiley and Sons. 1907. Cloth, $4.00.

The preliminary announcements, the contents and the preface of this book were full of promise and the reviewer opened it with great expectations. But, in reading, he experienced a succession of disappointments, and closed it with the sincere wish that he could be excused from the ungracious and uncongenial task of writing the review.

Chapter I. (16 pp.) contains some brief, interesting, historical items, also tables and extracts from consular reports relating to the use of denatured alcohol.

Chapter II. (47 pp.) describes methods of manufacture of alcohol from potatoes, corn, molasses and some other materials. Dr. Wiley's suggestion that cassava root is a promising raw material is not alluded to. There are numerous good cuts of machines. Under the heading "Theoretical *versus* Practical Yields of Alcohol" calculated yields are compared with those actually obtained from different raw materials.

The microorganisms and fermentation are not given space and thoroughness of treatment proportionate to their importance in the industry. The work of Pasteur, Hansen, Buchner, Effront and others, is disposed of in a few lines for each, and no references are added. A small figure in the upper corner of page 42 is the only illustration of yeasts and the magnification is not given. We could readily spare the picture of a floating thermometer (ordinary dairy or bath thermometer) on page 27 and the full-page illustration of "the largest fermenting tank in the world" on page 33, which shows nothing distinguishing it from a railroad water tank surrounded by a group of workmen, in order to make room for a little more information regarding those interesting microorganisms and the investigations done upon them.

There is an unnecessary duplication of some figures. For instance, cuts of ordinary floating hydrometers, the form of which may be assumed to be familiar to most readers, are found on pages 47, 48, 123, 142 and 259. On the other hand, pycnometers, probably less familiar objects and occurring in a greater number of useful forms, are not given one illustration.

Chapter III., upon the distillation and rectification of alcohol (58 pp.), abounds in electro-

types of fractionating flasks and towers used in the laboratory and elaborate cuts of commercial stills.

Chapter IV., on alcoholometry, contains 47 pages, of which 18 are tables for determining per cent. alcohol from the specific gravity—all of which belong in the appendix. It would have been well to insert a table for the conversion of readings on one technical scale into readings on another. The confusion and haziness in the definitions of "proof" alcohol are illustrated by the odd statement on page 123 " . . . (being equal to proof or 53.71 per cent. by volume of water and 50 per cent. by volume of alcohol) . . ."

The use of references and quotation marks is a little haphazard and sometimes one can not tell just what parts of the text are the author's and what parts he is taking bodily from the journals. This is nothing but carelessness and there is not the slightest indication of willful plagiarism. It is particularly noticeable on page 150, where, by the way, two references are given to the *American Chemical Journal* which can not be found in that journal. They are in the *Journal of the American Chemical Society*. There is no objection to reprinting journal articles bodily as is done very frequently in this book, only a journal article presupposes knowledge of technical details which it is the function of such a book as this to impart. There must be explanatory statements to make the article really useful to the average reader; there must be some editing, in other words. Mr. Herrick has not done enough of such editing and the result is that, despite the value of the numerous articles in themselves, the whole is not so instructive as it should be.

Chapter V. (38 pp.) is on the cost of alcohol and of alcohol-distilling plants. We have here many extracts from Bulletins of the U. S. Department of Agriculture and a few selections from the author's private correspondence. A little over one page of text is inserted, quite out of place, for it belongs under the head of the manufacture of alcohol, upon "The Manufacture of Ethyl Alcohol from Sawdust." Considering the possibilities latent in methods for obtaining alcohol from wood, this treatment is very inadequate. Not a single reference is given where more information may be obtained. The same chapter contains six full pages of coordinate paper on which the costs of buildings of different heights are laid off on one axis against length, width, etc., on the other. The information as to the cost of buildings is given elsewhere, and in more convenient form, as parts of general estimates for completed plants. At least five sixths of that space might have been saved and used to describe processes for obtaining alcohol from wood.

Chapter VI., "Alcohol as an Illuminant" (32 pp.). An interesting little historical sketch is followed by statements of the relative costs of lighting by alcohol and by oil. Methods for making photometric measurements are not touched. A simple diagram of the internal structure of an alcohol burner and a careful description would suffice, but there is an overwhelming array of figures showing lamps of different external appearance, hanging lamps, student lamps, bracket lamps, out door lamps, even a cut on page 231 of a gas jet fitted with an ordinary Welsbach mantle. Along here the text reads like a trade catalogue. For instance, on page 222:

> The accompanying cut shows the Phœbus Hanging Billiard Incandescent Alcohol Lamp. This lamp is of beautiful design and furnishes a very agreeable light for its purpose. The style shown is the large model, and is finished in rich reddish brown or sea-green. . . . The ornate hanging Phœbus lamp (Fig. 92) is finished in an exquisite variety of designs. . . . In Fig. 94, p. 224, is shown the beautifully decorated Phœbus Indoor Alcohol Lamp. This lamp is furnished with a rich bead shade, which can be had in any colors desired.

Without a pause we must jump from this style of literature to statements which presume a knowledge on the reader's part of the significance of the symbols "B.T.U." and the merits of the Harcourt pentane lamp as a standard.

Chapter VII., "The Fuel Value of Alcohol," etc. (40 pp.). The Williams bomb calorimeter is the only form of calorimeter described. The calculations and tables are interesting and instructive. There follow cuts of flat-

irons, curling irons, stoves for heating and for cooking, a "sterno-inferno coffee-machine set," and full-page illustrations of a "complete chafing-dish outfit trimmed with genuine ivory" and "teakettle set, trimmed with solid beaded edge."

Chapter VIII., "Alcohol as a Source of Power" (62 pp.). This chapter opens with twelve pages of excellent cuts and descriptive matter furnished by the Deutz Gas Engine Works "through the kindness of their American branch house, the Otto Gas Engine Works." Mietz and Weiss, Weber and Diesel, and Foos engines are illustrated.

Chapter IX., "Laws and Regulations for Denatured Alcohol" (32 pp.), is almost exclusively a compilation of circulars, regulations and acts of several governments; very interesting and useful, but they belong in the appendix.

A page on the recovery of denatured alcohol is forcibly injected into this chapter where it does not belong. The chapter closes with two pages on "spirit varnishes." This lost and forlorn little composition appears to contain all the book has to say upon the many important uses of denatured alcohol in chemical industries. It is indeed strange that a book on denatured alcohol should not give a brief sketch at least of the manufacture of ethyl ether, iodoform, artificial silk or smokeless powders. Chapter X. (14 pp.) gives extracts from consular reports, showing what enormous quantities of denatured alcohol are used for the above purposes in other countries.

Appendix (pp. 375–499). In this are reprinted government regulations, a report of a committee to the British Parliament, etc., all exceedingly interesting material, but almost all of it to be had for the asking and a postage stamp.

The bibliography on page 493 (not 489, as given in the index) is incomplete. Since some French and German titles are included, others should be. For instance, the *Zeitschr. f. Spiritusindustrie,* the German journal devoted to the subject, is not mentioned. Date and place of publication and authors' initials are in several instances omitted. If it is considered undesirable to include prices in a bibliography, the size of the work might be indicated in terms of pages. In his preface the author says: "The scarcity of literature treating the subject of denatured or industrial alcohol is so great that there are practically no books concerning it." The reviewer had occasion to look up the literature of the subject about a year ago and found many more articles than he had the opportunity to read.

The book as a whole has little claim to consideration as a scientific treatise, and its usefulness "practically" is somewhat problematical, although it contains much that is both good and useful, of course. It is a scrapbook made up from a superabundance of electrotypes, plenty of government publications and dealers' catalogues, some journal articles and too few references. It is raw material which one would naturally collect as a preliminary step to writing a book.

S. Lawrence Bigelow

Genera Avium. Edited by P. Wytsman. 4to. Brussels, V. Verteneuil and L. Desmet. Part VI., Picariæ.—Fam. Coliidæ. By P. L. Sclater. 1906 (1907). Pp. 6; pl. I. Part VII., Steganopodes—Fam. Pelecanidæ. By Alphonse Dubois. 1907. Pp. 4; pl. I. Part VIII., Picariæ—Fam. Musophagidæ. By Alphonse Dubois. 1907. Pp. 9; pls. II.

Three more parts[1] of this useful work have recently been published, one of which (part VI.), though dated 1906, apparently was not issued until May, 1907. The general treatment is the same as that of preceding parts, and need not again be explained. "Genera Avium" is, of course, not an exhaustive treatise, but the editor, Mr. P. Wytsman, deserves the thanks of ornithologists for his efforts to bring out a work that shall present in convenient, succinct form, the most important points regarding genera and species, with due regard for the results of recent research.

The Coliidæ, or colies (part VI.), a highly peculiar African family allied to the kingfishers, is considered by Dr. Sclater to con-

[1] For a notice of the five previous numbers, *cf.* Science, N. S., XXIV., 1906, pp. 438–439.