

*MODERN GAS MANUFACTURE.*

*A Text-Book of Gas Manufacture for Students.* By J. Hornby. Sixth edition, revised and enlarged. Pp. xi+423. (London: G. Bell and Sons, Ltd., 1911.) Price 7s. 6d. net.

THE fact that a sixth edition of Mr. Hornby's text-book was needed is the most convincing proof of its excellence, more especially as the readers to whom it appeals are necessarily limited in number, and other text-books on the subject exist.

The many alterations and advances which have taken place in gas manufacture during the past ten years have rendered it imperative to remodel the book so as to deal with the various types of vertical retort which are being introduced, and the use of increased charges for horizontals, which are found to give substantial improvement in the quantity and quality of both gas and tar.

The author disclaims any intention of making the book an exhaustive treatise on the subject, but in point of fact he so nearly attains this level that it is a pity he has not gone a little more fully into the theoretical aspect of carbonisation as gleaned from his own experience, rather than to rely on quotations from the work of others, which, although in most part excellent, sometimes give a wrong impression.

For instance, in speaking of the effect of distillation at low temperature, he quotes a paragraph from Dr. Lunge's work on "Coal Tar and Ammonia," to the effect that amongst the liquid, watery products "acetic acid is paramount," which, although true to a certain extent of the products obtained from lignite and peat, gives a wrong impression of the liquor obtained at low temperature from an ordinary gas coal.

After a brief general sketch of the usual procedure in a gas works, the author deals in the first chapter with the formation and general characteristics of the various classes of coal, and in discussing the conversion of vegetable deposits into coal, represents the complete reaction of fermentation and decay on cellulose by the beautifully simple equation,



which certainly does not take into account the feelings of the supporters of any dehydration theories. In discussing the caking coals, it would be worth while in a future edition to mention at any rate the influence of the percentage of oxygen on the gas yield and coking properties of various coals.

In the second chapter the wide subject of carbonisation is attacked, and here the description of the gaseous products of distillation due to primary and secondary actions are not quite in accord with the more modern views on the subject, but the remainder of this and the next chapter are very well done, and the reader is given next a section on labour-saving appliances, amongst which inclined and vertical retort settings are dealt with.

The diagrams of the Dessau, Woodall-Duckham, and Glover-West retorts are excellent, and it is a pity that the author has not dealt more fully with the relative advantages and drawbacks of these systems. There is but little doubt that the

continuous systems of carbonisation as represented by the two latter retorts gives the nearest approach to a uniform treatment of coal that is to be found, and that when the general arrangements have been perfected by experience they will show themselves to be far superior to their Continental forerunner, the intermittent Dessau retort.

The author's treatment of the modern practice of filling the retorts with the charge so as to leave no space at the top of the retort, and extending the period of carbonisation is insufficient, and the two reasons which he gives for the improved results obtained are not nearly so important as that the mass of coal provides a cool and easy escape for the hydrocarbon and other gases distilling from the portions in contact with the hot walls, and so prevents the destruction of valuable illuminants.

In this part of the work also some notice ought to be taken of Mr. Glover's Norwich chamber retorts, which for the same reason give excellent results.

It would have been of great advantage to the work if the author had compiled with care a table contrasting the results obtained by the various methods of carbonisation from the horizontal retort with small charges and high heats to the latest types of sloper chamber ovens.

In the appendix on the "Distillation of Tar," the author gives the specific gravity of ordinary tar as ranging from 1.12 to 1.16. Is this a relic of the days when the gas manager was content with 10,000 cubic feet of gas per ton of coal, or is it an up-to-date figure from the vertical retorts and modern processes? Has the author never come across that tar, which a large proportion of our gasworks are making, in which, owing to the degree to which the temperature has been pushed to obtain a large yield of gas, the specific gravity has been raised to 1.2 and above, and the value reduced almost to nil?

Perhaps the most serious fault that can be found with this text-book is that little or no attention is paid to the subject of the thermal value of gas. The day is rapidly approaching when illuminating value will be superseded by calorific value as the test for the quality of gas, when the calorie and thermal unit will be as important to the gas manager as the candle standard is now, and a text-book for the rising generation of gas engineers should certainly deal in full with the subject of how best to transfer the greatest heat value from the coal to the gas.

*THE DELINEATION OF THE EARTH'S SURFACE.*

*Maps and Map-making.* By E. A. Reeves. Pp. xiii+145. (London: Royal Geographical Society, 1910.) Price 6s. net.

THE course of instruction in surveying and map-making offered to students and travellers by the Royal Geographical Society is justly esteemed for its useful and practical character. A book on this subject by Mr. Reeves, the map curator of the society, who has for many years carried out the instruction, and under whose direction the system of teaching has