

the grasp of the scientific tyro, and a well-informed chemist would probably find little that was new to him. Nevertheless it is not without a certain fascination, if only by the mere perusal of a record which exhibits in a striking manner the wonderful fertility of the science and its extraordinary growth in recent years. Moreover, it is well written, well printed on good paper, and handsomely bound.

Anyone who succeeds in assimilating a fraction of the contents of the other fifty-nine volumes, in addition to this, may indeed claim to have reached a condition of modern culture of unexampled thoroughness.

J. B. C.

#### GAS, LIGHT AND AIR.

(1) *Gas Testing and Air Measurement*. By C. Chandley. Pp. vii+77. (London: Methuen and Co., Ltd., n.d.) Price 1s. 6d.

(2) *Light, Radiation, and Illumination*. Translated from the German of Paul Högnér by Justus Eck. Pp. xii+88. (London: The Electrician Printing and Publishing Co., Ltd., n.d.) Price 6s. net.

(1) THE title of the first of these books is somewhat misleading. In these days of high-pressure gas and the use of burners in which the adjustment of the induced air is of the first importance, it is very natural to suppose that a work entitled "Gas Testing and Air Measurement" has something to do with gas burners. This is not the case. By gas is meant fire-damp in mines, and the air measurement refers to the ordinary practice in mines of measuring the ventilating currents.

The author deals with the indications of the safety lamp as an indicator of the proportion of fire-damp if this is not outside the limits of 2 and 5 or 6 per cent., and of the effect of quantities above the explosive limit in putting out the flame. He does not refer to any of the devices that have been used for showing smaller quantities, as, for instance, Prof. Clowes's hydrogen lamp or Liveing's fire-damp indicator. The book is intended primarily for candidates for certificates under section 15 of the Coal Mines Act, 1911. It should serve this purpose well, as the discussion of the all-important cap of the flame of the safety lamp is very clear; some attention is given to the legal requirements and official regulations relating to coal mines, and the methods used for measuring ventilating currents are very fully explained.

(2) "Light, Radiation, and Illumination" is an admirable exposition of the science which forms the basis of the practice of the illuminating engineer. It is the object of the members of this recently organised profession to apply light so as to obtain economical and satisfactory illumination,

and not merely to place so many hundred candle-power of illuminating means in a room or a street. The scheme of the book is not unlike that of Euclid, but using the methods of trigonometry and the calculus and geometrical illustrations of a series of propositions following in logical sequence the demonstrations are as clear as any in Euclid, but the time and space required are vastly less than that which would be necessary with a purely geometrical method.

Beginning with a flat element of surface of a given luminous intensity, the author shows that the light radiated in different directions in space is proportional to the chords of a sphere to which the flat surface is tangent at the element. Then gradually sources of other geometrical forms are considered, and such real sources of light as filaments and arc light carbons. The illumination of surfaces and spaces, the effect of light-coloured walls, the curves of illumination from different sources, the uniformity of illumination with many lamps, and many other branches of the subject are treated fully and convincingly, and numerous tables for facilitating calculations in real cases are found as they are required.

While the forms of the illumination curves given by incandescent electric lamps and three kinds of arc lamps receive their full share of attention, no reference whatever is made to gas lighting. Now that the most beautifully lighted streets in London—Victoria Street, Pall Mall, and other streets in the West End, covering some miles—are lighted by high-pressure incandescent gas, it seems rather an omission not to have any statement even of the nature of the illumination curve of this type of burner. While the publishers may persuade themselves that electric illumination now is, after daylight, the only kind that matters, this is not the fact, and the author might with advantage have given the illumination curve of one type of high-pressure gas burner. In spite, however, of this omission, the book is a splendid example of science applied to an art which has been too long neglected.

#### OUR BOOKSHELF.

*The Place of Climatology in Medicine: being the Samuel Hyde Memorial Lectures, 1913*. By Dr. W. Gordon. Pp. v+62. (London: H. K. Lewis, 1913.) Price 3s. 6d. net.

At a time when the broad features of the climate of civilised countries are well established through long series of exact observations, it is well to be reminded that an accurate knowledge of the local variations, especially of wind and rainfall, are of vital importance in medical climatology. We have yet to produce properly contoured large-scale maps of climate, even for well-populated districts.