

apparatus was a "vacuum spectrograph" having prisms and lenses of fluorite, but Prof. Lyman has employed a concave grating of one metre radius, which is much simpler in adjustment and has the great advantage of permitting the determination of wave-lengths. A full description of this instrument is given, together with many practical details which have contributed to its successful manipulation. The absorption of various gases and materials in the region of short wave-lengths is fully discussed, and the spectra of the various elements which have hitherto been investigated are described in detail. Complete tables of these spectra, and a bibliography of the whole subject, are also included.

It is interesting to note that the author has lately succeeded in photographing the spectrum to wave-length 905, thus extending it as far beyond Schumann's limit as this was beyond the limit reached by Stokes, about wave-length 1850, if counted on the scale of oscillation-frequencies. Further extension by the direct spectroscopic method is beset by many difficulties, but the author does not consider it hopeless to make further attempts to reduce the gap between the shortest Schumann waves and the waves constituting X-rays, which have a wave-length of about one Ångström unit. In this gap the relation between "light" and matter undergoes a profound change, and further exploration would doubtless lead to results of great value.

The book is a valuable record of successful work in an important field of research, and will be indispensable to those wishing to undertake investigations in the Schumann region, or having occasion to make use of the available data of observation. It may, however, be confidently recommended to the larger circle of readers who are interested in the progress of physical science.

OUR BOOKSHELF.

The City of Dancing Dervishes and other Sketches and Studies from the Near East. By H. C. Lukach. Pp. xi+257. (London: Macmillan and Co., Ltd., 1914.) Price 7s. 6d. net.

THIS collection of papers, the work of a careful student of the Nearer East, most of which have already appeared in periodicals, is of value at the present time. The treatment, however, is sketchy, and some of the questions discussed do not easily lend themselves to popular writing. The chapter on the jests of the Turkish humorist, Khoja Nasr-ed Din, scarcely deserved re-publication, being a collection of "chestnuts," unless an attempt could have been made to trace their analogues in Western folklore. An interesting paper, based on personal knowledge, describes an interview with the Chelebi Effendi, the leader of the

Dancing Dervishes, a Persian by origin, a scholar and theologian, intimately associated with the Turkish Court, his function being to gird each new Sultan with the historic sword of Osman at the Eyub mosque at Constantinople, a ceremony which no Christian is permitted to witness. The best result to be expected from the sketch of the Sunni and Shiah sects and of the origin and influence of the Caliphate may be to attract the reader to the standard authorities, from Gibbon to the Encyclopædia of Islam.

The net result of the book is to show the weakness of the Turkish Sultans' claim to the Caliphate, which will probably now be transferred to the new Sultan of Egypt, and to illustrate the hopelessness of the prospect of a Jihad or holy war preached from Constantinople. The Allies are quite aware of the weakness of the Turkish position, and one result of the war must be that Islam will be revolutionised, much to their advantage.

The Principles of Irrigation Practice. By Dr. J. A. Widtsoe. Pp. xxv+496. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd., 1914.) Price 7s. 6d. net

As President of the Utah Agricultural College, Dr. Widtsoe has had almost unique opportunities of learning at first hand the results obtained by irrigation in the dry States of America, and in this book he gives a summary of his own investigations and those of others in neighbouring States. The general importance of the subject becomes manifest when it is realised that about 25 per cent. of the earth's surface receives ten inches or less of rainfall annually and can only be reclaimed by irrigation, while another 30 per cent. receives between ten and twenty inches of rainfall and requires irrigation for all intensive cultivation.

The first few chapters deal with theoretical considerations. The soil is likened to a mass of mineral particles, on which hangs a film of water; calculations are given to show its thickness, and some of its properties are sketched out. This view is necessarily only approximately correct, because it is now known that the soil has not this simple constitution, but is essentially a colloidal mass. Many of the theoretical considerations founded on the older and simpler idea therefore require modification. Similar remarks also apply to some of the coefficients and constants applied to the soil moisture: their theoretical interest is not great, although they are very important as guides to the practical man in irrigation practice. The chapters, however, give as good a summary as our present knowledge permits, and they clearly show how necessary it is to overhaul the whole subject in the light of modern conceptions.

By far the greatest part of the book is taken up with an account of the effect of irrigation on the crop and on the land, and illustrations and diagrams are given in profusion. The work is admirably done, and gives one of the best summaries of the subject that we have seen for some time.