

scientific workers give a personal touch to the text. We have tried it on a boy of ten and a somewhat *blasé* reader of fifty, and both give the same verdict—that it is extraordinarily interesting. We should like to have seen the authors' names, and we should like to cut the parts and bring, let us say, all the Hygiene together; but these are minor matters. We wish this popularisation all success, because it is sound; and what are the factors in this soundness?

It appears to us that the chief desiderata in an educational enterprise of this sort are the following:—Getting contributors with the gifts and graces already alluded to, plus the crowning humility of taking pains and obeying the editor (to whom our compliments); the good sense not to pretend that everything is easy, since nothing thorough is; the critical faculty of discerning what can be presented accurately, and at the same time intelligibly, for while most true ideas are clear there is a clarity that only dazzles the man in the street; and, last, the restraint which forbids "giving to the ignorant, as a gospel, in the name of Science, the rough guesses of yesterday that to-morrow should forget." We do not mean to suggest that this huge work has all these virtues in perfection, but it has striven after them, and therefore we wish it well.

#### OUR BOOKSHELF.

*Arabische Gnomonik.* No. 1. By Dr. Carl Schoy. Pp. 40+2 plates. Aus dem Archiv der Deutschen Seewarte. (Hamburg, 1913.)

THIS mathematical account of Moslem dialling, by a writer already known for his studies of Arabic astronomy, forms one of the publications of the Deutsche Seewarte.

The author first touches on the bibliography. There is food for thought in the fact that but two references are given to English writers. The Arabic sun-dial differs from that of the Greeks in having a single point, at the apex of a spike, for index, in place of the gnomon. The horizontal dial is first treated, and rules are given for laying off "temporary hour-lines." These hours, duodecimal subdivisions of the daylight interval, vary in length; nevertheless, their inconvenience did not prevent their universal adoption until the time of Abu'l Hassan, who introduced equal hours about 1200 A.D. They are specially dealt with in the third chapter. The analysis of the clepsydra in this chapter gives *unequal hours*, since it assumes—erroneously—a constant rate of discharge.

Next follow two chapters on the determination of the Kibla and the times of prayer—sunset, nightfall, dawn, noon, and afternoon (asr). The last, with its various definitions, is discussed in some detail. The closing chapters concern vertical, cylindrical, and conical dials.

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Though leaning towards the academic in places (the author employs declinations of  $36^\circ$ ,  $-69^\circ$ ,  $-45^\circ$ , and  $63^\circ$  on p. 21), the work is of high interest and much utility to all who have to do with Moslem chronometry. A few typographical errors apart, it is well printed, but an index would have been a useful addition.

J. I. C.

*Cotton Spinning.* By W. S. Taggart. Vol. I. Including all Processes up to the End of Carding. Pp. xxxvi+262. Fourth edition. Vol. II. Including the Processes up to the End of Fly-frames. Pp. xiv+245. Fifth edition. (London: Macmillan and Co., Ltd., 1913.) Price 4s. net each.

THESE books have been brought up to date, and much new matter and many illustrations have been added. In all essential respects they resemble the previous editions, which have gained a wide circulation among students and practical cotton-spinners.

*Modern Problems in Psychiatry.* By Prof. Ernesto Lugaro. Translated by Drs. D. Orr and R. G. Rows. With a Foreword by Sir T. S. Clouston. Pp. vii+305. Second edition. (Manchester University Press, 1913.) Price 7s. 6d. net.

THE first English edition of Prof. Lugaro's book was reviewed in the issue of NATURE for January 6, 1910 (vol. lxxxii., p. 273). The present issue differs in no important respect from the former; a large number of minor changes, including the correction of several errors, have been made.

#### LETTERS TO THE EDITOR.

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#### The Spectra of Helium and Hydrogen.

RECENTLY Prof. Fowler (Month. Not. Roy. Astr. Soc., December, 1912) has observed a number of new lines by passing a condensed discharge through mixtures of hydrogen and helium. Some of these lines coincide closely with lines of the series observed by Pickering in the spectrum of the star  $\zeta$  Puppis, and attributed to hydrogen in consequence of its simple numerical relation to the ordinary Balmer series. Other lines coincide closely with the series predicted by Rydberg and denoted as the principal series of the hydrogen spectrum. The rest of the new lines show a very simple relation to those of the latter series, but apparently have no place in Rydberg's theory.

From a theory of spectra (*Phil. Mag.*, July, 1913) based on Rutherford's theory of the structure of atoms and Planck's theory of black-radiation, I have been led to the assumption that the new lines observed by Fowler are not due to hydrogen, but that all the lines are due to helium and form a secondary helium spectrum exactly analogous to the ordinary hydrogen spectrum. This view is supported by recent experiments of Mr. Evans (*NATURE*, September 4, p. 5), who observed the line 4686 in a helium tube not showing the ordinary hydrogen lines. Prof. Fowler (*NATURE*, September 25, p. 95), on the other hand, brings for-