

unnatural; it is not even fitted for civilised conditions. Too many lives are lacking in health, happiness, and real efficiency. What Mr. Hargrave pleads for is more outdoor education and a renewed enthusiasm for vigour. Modern educational methods have tried to dispense with the natural individual recapitulation of racial history, and the result has been a dismal failure. Mr. Hargrave pleads for real sojourning with wild Nature, camp education, tribal training for boys, hardihood camps for young men, adolescence initiations, and open-air meditation. Perhaps there is a tendency to exaggerate the importance of tribal training; perhaps the author is not quite sound in his view of human instincts and their origin; perhaps it is not very fortunate to speak of "that process of natural selection known as Evolution"; perhaps the practical difficulties in the way of methodical open-air education for large numbers are under-rated; but there is no doubt that the book is full of the true eugenist enthusiasm and of valuable suggestions for making much of outdoor life and Nature's school. It expresses the boy scout's idea raised to a higher power.

Two general remarks we venture to make in reference to both books: (a) Half a loaf is better than no bread, and if a teacher cannot go all the way either with the open-air education of Mr. Hargrave or with the "spiritualised" education of Dr. Hayward and Mr. Freeman he may go some way; and (b) the relative failure of past educational endeavours is not wholly due to imperfect methods; it is largely due to imperfect material. Who is bold enough to set limits to what improved nurture can do? but a sober-minded vision cannot ignore the sad limitations of inborn nature. Yet one remembers a famous answer given to Nicodemus.

J. A. T.

#### OUR BOOKSHELF.

*The Cultivation of Osiers and Willows.* By W. P. Ellmore. Edited, with Introduction, by Thomas Okey. Pp. x+96. (London: J. M. Dent and Sons, Ltd., 1919.) Price 4s.

THE growth of osiers, as willows used for basket-making are popularly called, was a declining industry before the war, owing to foreign competition. From Germany, Holland, and Belgium we received, year after year, not only increasing quantities of osiers, but also large importations of baskets and basket-ware, as well as huge consignments of hoops for herring barrels, which are the product of a year or two's extra growth of the common species. Alarmed at the decline of an important local industry like basket-making, the Board of Agriculture, in order to encourage the extension of the area under willow cultivation, published a series of articles by Mr. W. Paulgrave Ellmore on the subject in its *Journal* for 1911 and 1912, which were reprinted in 1913 as a booklet—"Board of Agriculture, Miscel-

laneous Publications, No. 18." The present handbook is an enlargement of this, and is well worthy of the attention of farmers and landowners who have land suitable for the growth of willows. Osiers, it is necessary to point out, require good land in order to succeed, such as low-lying alluvial tracts beside rivers and streams, and they fail miserably on wet, undrained, swampy, or peaty soils.

Mr. Ellmore gives sound information on the cultivation and harvesting of the osiers and on the preparation of the rods for the market. A chapter on the numerous varieties which are used gives no botanical details, but is of interest in pointing out the special uses, adaptations to soils, etc., of these puzzling forms, which are generally supposed to have arisen through hybridisation of the four or five species under which they are classed. Another chapter deals with insect pests and methods of control. A final chapter treats of the three willows which are grown for their timber.

*Standard Tables and Equations in Radio-telegraphy.* By Bertram Hoyle. Pp. xiv+159. (London: The Wireless Press, Ltd., 1919.) Price 9s. net.

In his preface the author claims that no such complete book of tables and equations exists for the use of radio engineers. It is difficult, however, to see the guiding principle he has adopted in selecting his formulæ and tables. Several of the tables are antiquated, if not actually obsolete, and some of the information might well be given in an elementary text-book of arithmetic.

The author begins by giving the latest formulæ for calculating the capacity and inductance of various geometrical-shaped objects with high accuracy. Judging from this and other books on the subject, one would infer that radio-telegraphists spent most of their time in making calculations by the laborious formulæ so familiar to readers of the mathematical bulletins of the Bureau of Standards. Yet it is of importance to be able to calculate the capacity between spherical conductors or between parallel wires, and so we wonder why no formulæ are given for them in this book.

We find a table of haversines, but, as the haversine is not defined and we have forgotten what it means, it is no great help. We are given tables of all kinds of wire gauges—the Birmingham, the Brown and Sharpe, Stubs's steel wire, Whitworth's, piano-wire gauge, etc. For practical purposes these gauges are obsolete. Electricians and cable-makers nowadays talk about a 0.0100 wire—i.e. a wire the diameter of which is the hundredth of an inch. They do not talk about a No. 33 wire S.W.G. It is astonishing how long the gauge system, which was hopelessly unscientific, lasted in this country. We hope that when the cable-makers' new standards are published next summer the wire gauges will soon be forgotten.