PARA RUBBER.[1]

IN recent years the cultivation of rubber-yielding trees has attracted an increasing amount of notice. About 12,000 acres in Ceylon, and in the Malay Peninsula a still larger area, have been stocked with the Para rubber tree, *Hevea brasiliensis*, and other species of Hevea. The cultivation has also been successful in India and South America, and experimental plots are being tested in Uganda and the Gold Coast Colony.

In tropical Africa there are thousands of square miles of land suitable for growing the Para tree. But whilst the demand for rubber has been increasing with the development of the electrical and motor industries, the number of forest trees yielding the substance has been diminishing, year by year, as a consequence of the faulty methods of "tapping" employed by the natives. Hence a stimulus has been given to the production of rubber by cultivation; and with a view of fostering the industry in West Africa, Mr. Johnson was commissioned by Government in 1902 to visit Ceylon and study the methods employed there in the management of the plantations and the preparation of the rubber. He now gives, for the benefit of persons taking up the cultivation, some of the results of the visit in the form of such practical advice as would be likely to assist them in their undertaking.

The rubber trees are raised from the seeds, which may be obtained from Ceylon or the Straits Settlements at a cost of about 6*s*. 8*d*. per thousand. When the tree has attained a girth of twenty to twenty-four inches, the latex can safely be tapped; this may be in about five to seven years from the date of planting. The yield varies greatly, depending on the soil, the age of the tree, and the method of tapping. At present no really satisfactory data are available; but from such statistics as are given it would seem that about 1 lb. to 3 lb. of dry rubber *per annum* may be the average product of each tree In addition, the seeds yield a drying oil somewhat resembling that obtained from linseed. As regards the latex-bearing "life" of the trees, it is stated, on the authority of the director of the Botanic Gardens, Straits Settlements, that trees are known to have been tapped, off and on, during fifty years, and to be still yielding a plentiful supply of latex.

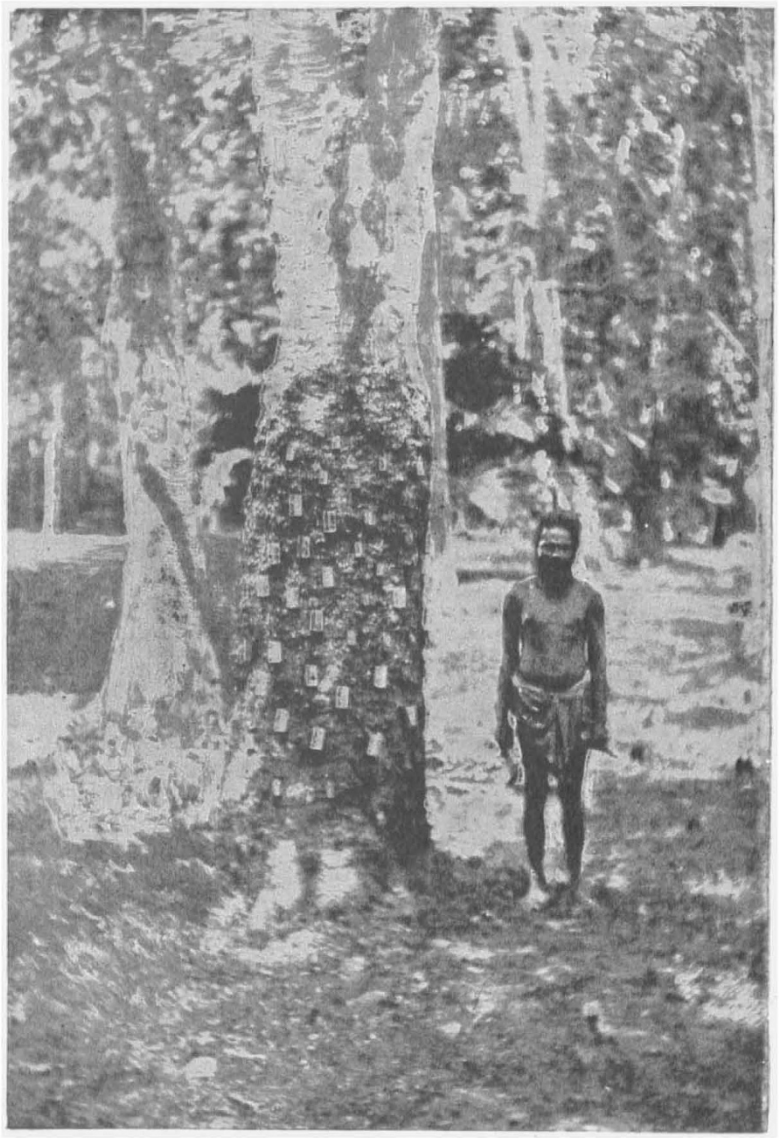

FIG. 1.—One of the Parent Trees of the Para Rubber Industry in the East, growing in the Botanic Gardens, Henaratgoda, Ceylon. (From "The Cultivation and Preparation of Para Rubber.")

The rubber-substance is contained in the latex of the plant in the form of minute globules, much as butter-fat exists in cow's milk. These globules can be made to coalesce by centrifugal action, just as cream is formed from milk in an ordinary separator; but the product thus obtained does not, apparently, compare favourably with the rubber given by the older methods of separation. These consist in coagulating the latex, either by simple exposure to the air or by the addition of an acid or a salt; the resulting coagulum is washed and rolled to free it from moisture and nitrogenous matters, and then dried by gently heating. The particular process suggested by the author is that of spontaneous coagulation of the latex in shallow saucers, followed, after washing and rolling, by exposure to the smoke of a wood fire as an antiseptic treatment. The price obtained depends largely upon the care exercised in the preparation. For example, Congo rubbers, which some time ago realised only 1*s*. to 1*s*. 6*d*. a pound, now often fetch 4*s*. in consequence of being more carefully prepared. As showing what can be done in this direction, it is interesting to note that Ceylon Para rubber has recently commanded the "record" price of 5*s*. 6*d*. per pound.

The appurtenances required are of the simplest,

[1] "The Cultivation and Preparation of Para Rubber." By W. H. Johnson. Pp. xii+99. (London: Crosby Lockwood and Son, 1904.) Price 7*s*. 6*d*. net.

and no great demand is made upon the skill of the cultivator who desires to try his fortune in this direction. As regards the call upon his capital, some idea of the cost of opening and maintaining a plantation will be obtained from the estimates which the author supplies, showing the expenditure in Ceylon and the Malay Peninsula. As an alternative to tea-planting, orange-growing, and cattle-ranching, the production of rubber would seem to be well worth consideration by young Britons who go abroad in search of a competency. C. SIMMONDS.

PREHISTORIC ENGLAND.[1]

AS this volume contains a notice by the publishers that they "will shortly begin" the issue of the series of "The Antiquary's Books," to which this belongs, it may be assumed that it is the first. For the reason that it is an earnest of the quality to be expected in its successors, the book, both in manner and matter, must be treated in somewhat more critical and judicial fashion than if the series had been already fairly launched. The responsibility of a publisher in placing an antiquarian library before the public is never light, and at the present time it suffers from the inequality of modern knowledge in respect to the various prehistoric and archæological periods. The later stages of the former class have vast floods of light thrown upon them by the constantly recurring discoveries in the Levant, and the comparative method has enabled us to classify many of our native antiquities by their means. In regard to the earlier stages of man's existence we are in the main still advancing at a painfully slow rate, and can scarcely be held to have more than a misty comprehension of the subject. In historic times the same want of balance of knowledge exists equally, though it is a far easier task to mask the difficulty, and to produce a nicely balanced tale from groups of facts of very different values.

The present volume deals only with the relics of man in Britain anterior to the coming of the Roman invaders, and in a sense, therefore, may be called prehistoric, for nothing in the nature of a native record can be quoted in support of any part of it. The author by his title, moreover, limits his field to the remains

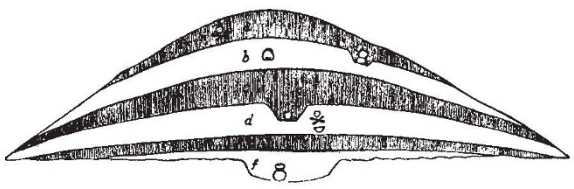

FIG. 1.—Section of Barrow with successive Interments. From "Remains of the Prehistoric Age in England."

of the dwellers in Britain, that is to say, to the monuments they raised, the implements they made, and the graves in which they deposited their dead. The racial characteristics, as shown by the physical characters, are treated very briefly, and the burning questions of the priority of Brythons and Goidels in the land, of the precise position of the Picts as an indigenous tribe, of the succeeding immigrations from the Continent bringing with them new types of people, of weapons, or of burial customs, are only incidentally mentioned.

By the elimination of all these questions Dr. Windle has set himself an infinitely lighter task; but it is to be questioned how far an intelligent reader can gain a true understanding of the conditions described without some fuller information on these points. It must be confessed, however, that the subject bristles with difficulties of all kinds and has tempting pitfalls for even the wary searcher, and, on the other hand, Dr. Windle has a right to set his own limits. Even within these limits he may be thought somewhat hardy, for to give an adequate account of all the material relics of man in Britain from the dawn of human life up to about 2000 years ago, within the compass of little more than three hundred pages, is not a thing to be undertaken with a light heart. One of the principal difficulties to be overcome is to avoid confusion in exposition and arrangement. In this matter Dr. Windle might have had more success. In

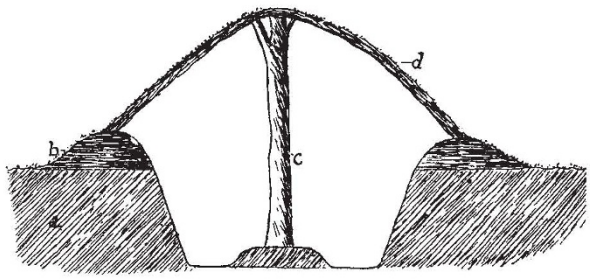

FIG. 2.—Ideal Section of Pit-dwelling. *a*, Natural soil; *b*, Bank of same heaped up around Pit; *c*, Central support of Roof; *d*, Roof of Turfs and Branches. From "Remains of the Prehistoric Age in England."

more cases than one, instances of special types of implements are quoted without giving the very necessary information that they belong to widely different periods. For instance, in dealing with "pygmy flints," a puzzling subject, Dr. Windle quotes a number of surface finds, and then goes on to say, "in France they have been discovered at Bruniquel." This can only mislead the inquirer or the student, for, so far as we know, the Bruniquel station, which is undoubtedly of the mammoth period, has no relation at all to such surface finds as have been made in Lincolnshire, Lancashire, India, or Belgium. Nothing is more certain than that mere type or form alone is the most unsafe criterion of age.

This elementary axiom may sound very like a platitude, but it is constantly neglected by men whose words carry weight, and cannot, therefore, be too much insisted upon. Such errors or vague statements affect the essentials of prehistoric science, and if persisted in inevitably retard the advance of knowledge instead of accelerating it, as D . Windle undoubtedly wishes to do. Again, it is very questionable wisdom to devote a chapter to "bone implements," the paragraphs dealing indiscriminately with the remains from the French caves, the Swiss lakes, and from a station like Grime's Graves. In the first place, there is again no relation between the sites quoted, and, so far as the French caves are concerned, the "bone" implements are mostly of horn. No doubt the information necessary to a proper understanding of the relative ages of the Dordogne caves, the Swiss lake dwellings, and the Norfolk flint pits is to be found elsewhere in the book; but for a popular work dealing with a difficult and complicated subject the first essential is clearness of exposition beyond all possibility of misunderstanding.

Further, Dr. Windle's authorities are occasionally antiquated. It is not treating the reader quite fairly to give him Dr. Thurnam's classification of barrows without qualification. Is it, for instance, quite certain in the light of recent knowledge that all round barrows are of the Bronze age? It is also a trifle hard to find the late Dr. Frazer quoted as an authority on

[1] "Remains of the Prehistoric Age in England." By Bertram C. A. Windle, Sc.D., F.R.S. Pp. xv + 320; illustrated. (London: Methuen and Co.) Price 7*s*. 6*d*. net.