

them. In these circumstances it is not to be wondered at if the value of pruning in any form or degree has come to be questioned by certain fruit-growers and experimentalists, who have had very little difficulty to expose all parts of the tree to the sun and of diminishing the crop.

It still remains incontrovertible, however, that young trees are benefited by a moderate degree of pruning if this is carried out by intelligent operators possessing the knowledge and experience necessary for the task. Such pruning is necessary for forming a proper foundation for the tree, for the removal of cross-branches, and the thinning out of the centre in order to better expose all parts of the tree to the sun and air.

This volume, prepared by the horticultural instructor for the Department of Agriculture, South Australia, under the direction of the Hon. Minister of Agriculture, is issued for the purpose of teaching the technique of pruning to fruit-growers having to work under the climatic and economic conditions prevailing in temperate Australia. The author's qualifications for teaching are clearly shown in his sensible and pertinent remarks upon the facts on which the theory of pruning is based, and his description of the objects the pruner seeks to obtain. Having instructed the reader in these matters, he describes the opposite effects of winter and summer pruning, the parts of a tree, and their different values; also the forms of tree to be encouraged, and the best means of developing fruit-bearing wood in place of foliaceous but barren branches. He next passes to a description of the specific treatment of different kinds of fruit, including apricot, plum, cherry, almond, peach, apple, pear, quince, fig, orange, lemon, and loquat.

There are 200 illustrations from photographs, most of these being valuable as a means of explaining the text, but others are inferior, and their omission would not have detracted from the appearance of the volume.

UNCONSCIOUS MEMORY.

Unconscious Memory. By Samuel Butler. New edition. With an Introduction by Prof. Marcus Hartog. Pp. xxxvii+186. (London: A. C. Fifield, Clifford's Inn, E.C., 1910.) Price 5s. net.

IT is probable that Butler will live in history as the writer of "Erewhon," but his more serious works, dealing with what may be called the philosophical side of biology, are still worth reading, and Mr. Fifield's re-issue will be welcomed by many. The volume under review consists partly of rather personal polemic against Darwin, and partly of a further development of Butler's views as expressed in his "Life and Habit." These views may be summarised as follows.

It is a fact of hourly observation that practice makes things easy which once were difficult (*e.g.*, the playing of a sonata), and even results in their being done without consciousness of effort. It follows that the fact of an intricate action being done unconsciously is an argument for the supposition that it must have been done repeatedly already. Now take the case of

a newly-hatched chicken, which pecks at once and perfectly. How is this? It is because something in the chicken remembers having pecked before, and consequently knows how to do it. An individual is not a new being; it—or part of it—has existed in the bodies of its parents. Thus heredity is memory. Cells remember what they have done before, and know how to do it again.

This, followed to its conclusion, involves the attribution of some kind of intelligence even to atoms. Indeed, we can hardly avoid it. Atoms have their likes and dislikes. Carbon and oxygen are sociable, fluorine is reserved and stand-offish. "The distinction between inorganic and organic is arbitrary." (This view is closely akin to that of Haeckel.) All action is purposive and intelligent. When an organism develops a new quality, it is because the organism has felt the need of it. Evolution is therefore teleological from within; differentiation of species, and variations of all kinds, are not entirely due (or as much as Charles Darwin supposed) to natural selection. Here Butler follows Buffon, Lamarck, and Erasmus Darwin.

Mr. G. Bernard Shaw has said that Butler was, in his department, the greatest English writer of the latter half of the nineteenth century; and, though he was only a *dilettante*, it is surprising how illuminating and suggestive his ideas seem, even now, thirty or forty years after first publication. It is noteworthy that Dr. Francis Darwin quoted him with special approbation in his presidential address before the British Association in 1908.

Prof. Marcus Hartog furnishes a useful introduction, discussing Butler's whole work and his place in the history of science.

The first edition of "Unconscious Memory" was reviewed in NATURE, January 27, 1881.

THE MAMMALS OF EUROPE.

Faune des Mammifères d'Europe. By Prof. E.-L. Trouessart. Pp. xvii+266. (Berlin: R. Friedländer and Sohn, 1910.) Price 12 marks.

IN issuing an up-to-date descriptive catalogue of the mammals of Europe Prof. Trouessart has conferred a real and lasting benefit on zoological science, since, owing to the great increase of species and races due to modern methods of discrimination, the well-known work of Blasius has long been practically useless. Indeed, if the two works be compared, it might at first sight be difficult to believe that they treat of the same subject, so great has been the increase in the last few years in the number of recognisably distinct forms, and so extensive the changes in nomenclature. Nowadays views differ—and will probably continue to differ—as to the limitations of species and races; but Dr. Trouessart appears inclined in most cases to use the former term in the most restricted sense. Justifying himself in doubtful instances by the dictum of Desmarest that "il est plus misable de trop réunir que de trop diviser," he might, if we remember rightly, have supported an opposite view by a statement of Huxley to the effect that it is more important to re-