BRITISH FISHES

Natural History of British Fishes: their Structure, Economic Uses, and Capture by Net and Rod. Cultivation of Fish Ponds, Fish suited for Acclimatisation, Artificial Breeding of Salmon. By Frank Buckland, Inspector of Fisheries. (London: Society for Promoting Christian Knowledge.)

IT would have been difficult for Mr. Buckland to produce a dull book on any question connected with the economy of our fisheries; his merit in this respect has tended, however, to lead him too much in an opposite direction. It is painful, now that we are deprived of the living presence of the genial naturalist and industrious fishery inspector, to write an unkind word regarding any branch of his life's work; but of this book we are compelled to say that we would have appreciated it better had it been less "familiar" and more scientific. That it should be full of interesting information about fishery matters was quite to be expected from the richness of the stores which its author always had at his command, and if Mr. Buckland had taken pains to digest the *matter* so lavishly extracted from *Land and Water*, and had likewise collated the miscellaneous information contained in the volume with care, he might then have enjoyed the satisfaction of presenting to the public a natural history of British fishes which probably would have compared satisfactorily with other good books of the kind. It is not too much to affirm that a carefully edited selection from the numerous essays contributed to the various blue-books to which the deceased gentleman was so voluminous a contributor, would have made a more interesting volume than the present work. The fact is, Mr. Buckland was nothing if he was not sketchy and rapid; he would not be tied down to severe statements, but preferred to give an off-hand opinion in a dashing way, no matter that he might find out within the year that what he had advanced was very far wrong. In the present volume, as a glance at the plethoric title-page will show, Mr. Buckland attempted too much, with the result that portions of the information conveyed are scrappy, while some of it is probably slightly imaginative: books and articles written in railway trains often enough provide hard work for the reader. In a preface to his work Mr. Buckland takes pains to point out how greatly we are deficient in *exact* knowledge of the habits of our sea-fish, of the times and places of their spawning, of the food they eat, and of the period at which they are able to repeat the story of their birth. Some of the many questions which are asked by Mr. Buckland we are under the impression he should himself have been well able to answer. Whether cods' eggs "sink or swim" has been often discussed, and the author ought to have been able to tell us the truth in that matter; but, on turning to the account given of the cod-fish in the present book (p. 50), it seems to be singularly deficient in its details of the natural history of that animal. So far as we can observe, no reference whatever is made to the theory of Sars with reference to the floating of the eggs, but a few pages relative to the personal adventures of the author are not wanting, whilst the old story of "the Logan fish-pond" is re-told with great circumstantiality. Twenty-five pages of the work are devoted to the salmon (*Salmo salar*), and the essay, confused as it is, is well worthy of perusal, although it contains, as do other portions of the book, a good deal about Mr. Buckland, and recapitulates, as usual from *Land and Water*, an account of some of the big fish in "my museum." It would be a tedious process to anatomise the contents of this "Natural History of British Fishes"; taking all that is written at its true value, we set down the work as an interesting collection of miscellanea. The account given of the Loch Leven trout (*Salmo Levenenses*) is exceedingly meagre, as is likewise the descriptions of several other fresh-water fishes, notably the vendace of Loch Maben. The most suggestive part of the present work is that which is devoted to "Pisciculture" (pp. 334 to 375). Under the title of "The Cultivation of Fish Ponds," much interesting matter is given, and a good deal of information that must be new to the uninitiated is set forth. But notwithstanding the many pleas for pisciculture which have at various times been advanced, it is questionable if the cultivation of other fresh-water fish than the salmon would *pay* as a food resource. A larger supply of trout would no doubt be welcome to the angler, because the trout is *the* fish of the angler *par excellence*; moreover in many places angling has now to be paid for, and lairds in Scotland who let their moors and lochs can always lease them to greater advantage when they are well stocked.

OUR BOOK SHELF

Proceedings of the Aberdeenshire Agricultural Association. (Fourth Annual Report, 1879-80.)

WE have here an account of the field and laboratory experiments carried out by Mr. Jamieson for the Aberdeenshire Association during the year 1879. The crops experimented on were turnips and oats. As before, the principal object in view was to ascertain the comparative manuring value of various phosphates in different states of aggregation. We can glance at only a few points in the results.

Mr. Jamieson claims to have shown that a finely powdered mineral phosphate, as, for instance, powdered coprolite, is nearly equal as a manure for turnips to the same amount of phosphate applied in a soluble form as a superphosphate, while the simply powdered phosphate is of course much cheaper than the manufactured manure. There is probably no doubt that on some soils a finely powdered mineral phosphate is sufficiently soluble to produce a considerable effect on the crop, if only the phosphate is applied in sufficient quantity, so as to present a considerable surface for attack; and to Mr. Jamieson belongs the credit of giving prominence to this fact, though it was by no means unknown before his experiments. There is however no reason for supposing that dissolved and undissolved phosphates have the same manurial value. When large doses of each are applied the manures may appear of equal value, because while the undissolved phosphate is sufficient for the wants of the crop, the dissolved phosphate is in excess of all requirements, and is therefore wastefully employed. Mr. Jamieson applies 100 lbs.[1] of phosphoric acid per acre both as dissolved and undissolved phosphate; that is to say, about 3 cwts. of bone ash and 5 cwts. of bone-ash superphosphate. Such a comparison is probably quite unfair to the soluble phosphate. For the small turnip crops obtained in Mr. Jamieson's experiments 2½ cwts. of

[1] On page 15 of the appendix the amount of phosphoric acid applied per acre is stated to be 100 lbs., but on page 16 the quantity is given as 200 lbs.