in its own home may be unknown beyond a radius of fifty miles. Nevertheless some of the gods are revered generally; Damballa, for example, whose signature is the snake, and the goddess of love, whose position in relation to Voodoo as a fertility cult is indicated not only by the fact that she has no children, and is implacable to women, but also in that every man in Haiti is regarded as her husband. It is significant that two types of gods or spirits are recognized—the Rada or Arada, who are the good gods, to whom only pigeons and chickens are sacrificed, and the Petro, the more powerful and evil gods, who can,

however, be made to do good things. To them are offered pigs, goats, sheep, cows and dogs, and even on occasion dead bodies from the tombs. The Rada are said to have been brought with the Negroes from Guinea or Dahomey; the Rada came from the Congo.

This brief mention of one feature only in Voodoo belief does less than justice to a remarkable record, which will repay close study by those who wish to understand the mentality which underlies what has been the most remarkable experiment in self-government of the black races, on their own initiative, of modern times.

HABITS AND HABITATS OF TROUT

Trout Streams

Conditions that Determine their Productivity and Suggestions for Stream and Lake Management. By Dr. Paul R. Needham. Pp. x+233. (Ithaca, N.Y.: Comstock Publishing Co., Inc., 1938.) 3 dollars.

THIS book is an attempt to place in the hands of anglers, sportsmen, and aquatic biologists, trustworthy information relating to trout and streams in which they live.

The author is well qualified by years of experience to undertake such a work and has done it very well, not only using his own researches into stream problems but also that of many workers in his own country and in other lands where trout streams abound. The opening chapter deals largely with the various kinds of trout to be found in North America in both streams and lakes, dealing also with the habits of the different fish, followed by the chemical and physical conditions of trout streams in general and how such factors as temperature, transparency, oxygen content, and river bed play their part.

The importance of biological indicators as evidences of pollution as against that of chemical analysis is stressed—a line which is advocated in Great Britain. A very well illustrated chapter deals with trout stream animals which serve as food for trout, and should prove very useful to aquatic biologists, while it cannot fail to attract the angler with very little interest in stream organisms apart from fish. The line drawings and photographs are very clear and the tables show evidence of much work in collecting the data.

An interesting point to which attention is directed is the large numbers of land insects which are taken by trout at certain times of the year; the probable reason for this is well discussed. A very large number of stomach contents have been

examined to obtain the information, and so far as streams in the central area of New York State go, the author points out the amounts of foods fall in the following percentages: caddis flies, two-winged insects and may flies, 66 per cent taken in the order stated, beetles fourth (6.6 per cent of total), spring tails, leaf hoppers, ants, bees and wasps furnish 3–6 per cent of the total, with other foods about 1 per cent, made up of crayfish, shrimps, grasshoppers, stone flies, true bugs and earthworms.

The distribution of the food in streams is dealt with under the heading of the physical conditions of the bed of the stream, stream flow and depth. The methods to be adopted in taking a census of the stream animals is described and is much on the lines adopted by workers in other countries. Stocking, propagation, and protection find a place in the book, followed by the management of trout waters gained by experience in many States.

A very useful appendix deals with the numbers and sizes of fish it is wise to introduce into streams where restocking is done, taking into account size of stream and available natural foods. Outlines are given of stream surveys and how the information should be recorded to be of use for comparison with later surveys or with those of other rivers.

There is a very extensive bibliography, which should prove very useful to those seeking fuller information on the points dealt with. The book is very well illustrated with photographs of weir fishing pools and the like, making it very attractive to the non-technical reader as well as the scientific investigator. It also gives an insight into the extent of the investigations undertaken by workers across the sea, and being written by one who, in addition to being a scientific investigator is also an angler, links up the two sides of the questions that arise.

W. RUSHTON.