

main accounts of the species has the advantage of facilitating direct comparisons but little else to recommend it. Some may also find it a nuisance that habitats are sometimes described in terms of life-zone concepts (for example, Sonoran, Hudsonian, Arctic Alpine) that are not defined in the book, rather than in terms of the natural vegetation the distribution of which is mapped (Plate 47).

There can be no doubt of the quality of this book with its reliable information and excellent illustrations, and equally there can be no doubt that its publication will stimulate studies that must result in an increased knowledge of a group of animals still relatively little known.

H. W. PARKER

SCIENTIFIC PRINCIPLES OF FURNACE TECHNOLOGY

The Science of Flames and Furnaces

By M. W. Thring. Pp. xiv + 416. (London: Chapman and Hall, Ltd., 1952.) 42s. net.

THIS book is a useful contribution to the scientific study of flames and furnaces, a subject in which a fairly extensive background of applied science already exists, but is not readily accessible to the average reader of the subject. Furnace design is a somewhat specialized subject, and furnace practice is almost every industrialist's concern. Nevertheless, the systematic treatment of the subject in text-books has been curiously enough neglected. It would be unfair, however, to claim that furnace technology is therefore backward, though frequently such criticism of modern furnace development has been heard. In point of fact it is commonly the rule in the technology concerned with the development of valuable industrial plant that practice is in front of the text-book exposition of the subject. In the present case, however, as the title of the volume indicates, the author is concerned with the science rather than with the technology of the subject.

The introductory chapters are devoted to the heat liberation from the flame and the subject of heat transmission. Novel features deal with the interpretation of the second law of thermodynamics in terms of what has been called the 'virtue' of a system's energy, and a more than usually complete treatment of the subject of flame radiation. One doubts whether the introduction is necessary of such special terms to define the obvious value of the heat potential of the fluid above the levels of temperature in the furnace. Indeed, such may even lead to confusion of ideas. Useful summaries of recent experimental work in furnace investigations, in heat transmission and in the determination of thermal constants are given. These constitute perhaps the most valuable features of the work. Again, under the somewhat pedantic title of "Aerodynamics of Hot Systems" are included those sections of the work which describe the science of draughting of furnaces and of jets of hot gas. This chapter comprises a good collection of references, but resembles so much a series of notes and mathematical formulæ, signs of a worthy effort to collect as much information as practicable into a limited number of pages, that the reader is left with the feeling that for an effective understanding of the subject he must still consult the original papers. The chapter purporting to cover the science of furnace construction

is mainly devoted to refractory and insulating materials. It is so condensed that it serves only to give guidance to a very limited series of references.

The final chapter on scientific method is a valuable and suggestive one.

The paragraphs are numbered in the manner of the Cambridge mathematical texts. It is doubtful if the average reader takes much notice of the numbering, but he will profit from the useful summaries at the ends of the chapters. This may in some degree compensate for a somewhat meagre index. The book is well produced, the printing clear, and the illustrations legible.

ORNITHOLOGY OF THE CHANNEL ISLES

The Birds of the Channel Islands

By Roderick Dobson. Pp. xvi + 263 + 25 plates. (London and New York: Staples Press, Ltd., 1952.) 30s. net.

IN the middle of the last century a great change began to take place in the use of the land in the Channel Islands, owing to the development of early fruit and vegetable growing for the London market. This necessitated the cutting down of orchards to make room for glass-houses, the draining of wet ground, and clearing of rough areas for early potatoes. Unfortunately there is little information as to the status of the resident species, or summer visitors, previous to 1866 when Cecil Smith published his "List of Birds . . . Summer Visit to the Channel Islands, exclusive of Jersey", which was amplified in his "Birds of Guernsey" (1879). Some species have ceased to breed owing to the increased utilization of the land, and others from some unknown cause. The choughs, for example, were common in Guernsey in 1878, in Alderney they ceased to breed in 1876, in Jersey in 1880, and in 1929 a pair were seen in Guernsey—the last record for the Channel Islands. In the British Isles the increase of jackdaws is sometimes blamed for the decrease of the chough; but in the Channel Islands jackdaws were never very abundant and have now decreased, and only a few nest in the western half of Jersey.

It is interesting to note that during the German occupation carrion crows, which in the breeding season were formerly confined to the cliffs, began to nest in woods and trees inland. This was owing to all the farmers' guns having been confiscated. During the same period the Germans felled many of the tall trees in the sheltered valleys, with the result that in a year or two the undergrowth increased and black-caps and garden-warblers began to nest again, which they had not done for many years. On the cliffs and rocky islands around Guernsey and the other main islands, many kinds of sea-birds breed and, during the Second World War, an additional species—the gannet—established colonies on the rock of Ortac and Les Etaes, off Alderney.

The information about each species is arranged in this book under the four largest islands, and in some cases the available information is rather meagre; nevertheless this is a valuable contribution to the ornithology of the Channel Islands, and no doubt in a future edition there will be many additions to the list of species, especially among the migrants. There are a number of photographs of various birds, nests and well-known breeding places.