Seventy-six species are recognized, and the thoroughness of the work is indicated by the very large proportion that have been described by the authors in the course of their studies. Synonymy is given in full and expresses the confusion to which Hooker referred, dating back sometimes to Linnæus himself. The species are very unequally distributed among the sections; elaborate keys are supplied for their identification. Each species is described at length and each description is admirably supplemented by a plate which, whenever possible, includes details of form of the storage organ, together with figures of leaf, flower and fruit. Dialect names are discussed, and economic uses, mainly as food, for which often careful preparation is required that poisons may be removed which have also economic uses. Geographical distribution is given in very great detail, and every specimen examined is cited.

The production of the plates, which suggests a crayon drawing, is pleasing. Some are by native artists, others by the late Matilda Smith of Kew and others by Mr. Burkill himself. There are also five plates of maps indicating the geographical regions recognized and the distribution of the individual species. The financial aid of the Bentham-Moxon fund towards the production of the plates is acknowledged.

Theory of Fourier Integrals

Introduction to the Theory of Fourier Integrals
By Prof. E. C. Titchmarsh. Pp. x + 390. (Oxford: Clarendon Press; London: Oxford University Press, 1937.) 17*s.* 6*d.* net.

SINCE the publication of Prof. Zygmund's "Trigonometric Series" in 1935, there has been considerable demand for another book dealing with trigonometric integrals. Prof. Titchmarsh's book meets this demand. He is already well known to students of mathematics by his text-book on the theory of functions, and his new book comes up to the high standard of the former.

After two more or less introductory chapters, Prof. Titchmarsh devotes a chapter to the theory of Fourier transforms in the class L^2, that is, the class of all functions whose squares are integrable in the Lebesgue sense. This is undoubtedly the most important part of the subject. The theory centres round a very beautiful theorem due to Plancherel, which asserts that every function (x) of Lf^9 has a Fourier transform $g(x)$ also in the class L^2 and

$$\int_{-\infty}^{\infty} \{g(x)\}^2\,dx = \int_{-\infty}^{\infty} \{f(x)\}^2\,dx.$$

Plancherel's original proof was published in 1910, and since then other proofs have been given by various writers. Prof. Titchmarsh gives four of these proofs, including Nobert Wiener's very interesting proof, of which the chief feature is the use made of the Hermite polynomials.

The Lebesgue theory of integration is fundamental in all this work, and in reading this chapter no one can fail to be impressed by the tremendous amount which the theory of Fourier integrals and mathematics generally owes to Lebesgue's definition of the integral.

The chapter on Fourier transforms in L^2 is followed by another on transforms in L^p. The symmetry which exists in L^2 is of course lost in other Lebesgue classes. There are, however, analogues for most theorems. Among the other topics treated may be mentioned the general theory of transforms and the theory of conjugate functions. The last two chapters are devoted to applications to the solution of differential equations and integral equations respectively. In the latter chapter, examples are given of the use of Fourier transform methods in the theory of probability and statistical dynamics. The book concludes with a long bibliography.

Prof. Titchmarsh is to be very warmly congratulated on his book. As the title implies, it is primarily an introduction to the subject and does not cover the whole field. The author has not attempted to give an account of all the recent developments, especially the more specialized ones. Those who wish to pursue the subject further can refer to Wiener's "Fourier Integral", Boehner's "Vorlesungen über Fouriersche integrale" and, above all, Paley and Wiener's, "The Fourier Integral in the Complex Domain". Fourier integrals have much in common with Fourier series, and this subject has been very adequately treated in Zygmund's book, to which reference has already been made.

The book under notice is probably of more interest to analysts than to applied mathematicians, but the latter might find much that interests them. No one should be put off by the Lebesgue theory of integration, as it is only necessary to know a few of the properties of the integral, especially those concerning strong convergence. The book contains a sufficient number of examples, including applications to mathematical physics, to illustrate the scope of the methods. A. C. OFFORD.