impulses go, and in what ways the peripheral receptive fields are projected, or what disabilities performance tests disclose after certain operations, etc. Complex interconnexions such as those between hypothalamus and the pituitary gland require a firm histological basis as a first step towards establishing functional interaction.

In this general field of research to which Prof. Glees himself has contributed valuable information he is also a good guide. These sections, the leading ones in the book, are accompanied by excellent anatomical diagrams and describe the modern work in an easy, fluent style. Briefly the book is best described as an introduction to recent advances in the morphology and physiology of the brain. In this sense it is complete in its treatment of the facts and ideas that have been advanced during the past twenty years.

RAGNAR GRANIT

STRESS AND ADAPTATION

The Stress of Life

By Dr. Hans Selye. Pp. xx + 324 + 7 plates. (London and New York : Longmans, Green and Co., Ltd., 1957.) 18s.

DROF. H. SELYE'S book is an attempt to give an account of his concepts of stress and adaptation for the general reader. It is perhaps scarcely to be expected that one should find in it rigid definitions and deductions. The method he uses is more impressionistic and is illustrated with allusion and metaphor rather than by tabulation of data. Nevertheless, there are passages of some interest where he seeks for definitions, for example, "stress is the common denominator of all adaptive reactions in the body. This is simple and true, but perhaps still too vague". Later, "STRESS IS A STATE MANIFESTED BY A SYNDROME . . ." (sic) and "The condition of biologic stress is essentially an adjustment". Such samples of the method of typography, discussion and definition illustrate the characteristic empirical, as it were non-logical, approach. The italics and capitals are a sort of substitute for definition, warning one not to ask such questions as whether a 'state' can be an 'adaptation', and so on.

Certainly, the method allows the presentation of many interesting points of view about the whole subject of "adaptability, or adaptation energy", of which "it is as though we had hidden reserves in the body". The subject is such a challenging one and so much neglected that any discussion is welcome. Prof. Selye's treatment is, of course, that of an endocrinologist; he sees the mechanisms of adaptation in terms of a hormonal system, centring on the pituitary. No doubt he would be the first to admit that this system of mammals shows, in a specialized form, reactions that are common to all life. Within the framework of his system he considers inflammation, arteriosclerosis and a long list of diseases of adaptation, including nervous and mental diseases and sexual derangements. Indeed, it is difficult to avoid feeling that his concepts are so wide that they include too much. Perhaps it is not fair to blame this entirely on Prof. Selye. Adaptation is an omnipresent and mysterious phenomenon, and yet we have no adequate concepts for dealing with it. One may sympathize with the conclusions of his final discussion that there is need for a "new type of medicine", but it is doubtful if this can be supplied only by the endocrinologist, however long his list of specific substances and hormones. J. Z. YOUNG

STATIONARY TIME SERIES

Statistical Analysis of Stationary Time Series

By Dr. Ulf Grenander and Prof. Murray Rosenblatt. (Wiley Publication in Mathematical Statistics.) Pp. 300. (New York : John Wiley and Sons, Inc. ; London : Chapman and Hall, Ltd. ; Stockholm : Almqvist and Wiksell, 1957.) 88s. net.

A NALYSTS of stationary time series tend to fall into one of two groups. One prefers to express the properties of the series in terms of its autocorrelation structure; the other uses the periodogram or the spectrum. Seeing that the results of one method can be transformed by a Fourier analysis into the results of the other it might have been supposed that the 'complete analyst' would use either, according to convenience. But in general, this is not so, and there is a good reason for it. The basic models studied by autocorrelation methods are such that in general no underlying periods in the strict sense exist as, for example, in economics; those studied by spectral analysis are more concerned with harmonic components, as, for example, in engineering and the physical sciences.

This book by Grenander and Rosenblatt is concerned mainly with spectral analysis. It begins with an account of stationary stochastic processes and the analysis of parametric models; proceeds to problems of estimation of the spectrum and the sampling distribution of spectral estimates; and concludes with problems in linear estimation and some assorted topics of a related nature. The examples are drawn mainly from the physical sciences—optics, turbulence and ocean waves. There are about fifty exercises, a six-page appendix on complex variable theory and a bibliography.

The statistical problems which arise in the analysis of time series are truly formidable and in several ways require techniques which are not familiar to many statisticians. It is accordingly very useful to have this unified treatment of the spectral approach. The authors, noting that existing literature is characterized by a certain lack of precision, have devoted a good deal of space to rigorous mathematical proofs. This, it must be admitted, makes the book rather difficult reading; but then it is a difficult subject, and one applauds their willingness to make assumptions which would be restrictive to a mathematician seeking complete generality but are no limitation so far as concerns practical applications.

In one respect the ideas advanced in the book will require further consideration. Most models used for the study of time series depend only on a finite number of parameters. The authors feel that the estimation of the spectrum is a better approach because it contains an infinity of parameters and hence provides a method of greater generality. But the estimates to which it leads are much less precise, and, as the authors themselves point out, any good estimate of the spectral density is biased. For long series such as occur in physics this may not be serious; but for economics it is fatal, even if (which is not the case) the spectral density could be given an interpretation. It remains to be seen, in some subjects at least, whether the spectral approach may not have the wraith-like quality suggested by its name.

Nevertheless, this is a useful book and should form a normal part of the time series analyst's equipment. M. G. KENDALL