First Course in Probability and Statistics. By J. NEYMAN. Henry Holt and Company, New York. 350 pages, illus. 1950.

ANYONE who has some acquaintance with Professor Neyman's contributions to mathematical statistics will naturally expect a scholarly treatment of this subject, combined with a style of writing that makes it come very much to life on the printed pages. He will not be disappointed. Moreover, this book is unique among its fellows in that statistics is presented as a branch of Probability Theory.

According to the preface, it is intended as a text for "(i) students who would like to take just one course in mathematical statistics for purposes of general education, (ii) prospective future mathematical statisticians and (iii) students who specialize or intend to specialize in one of the fields of application and need mathematical statistics as a useful tool in their own studies." He visualizes the first two categories as being freshmen or sophomores, and the third as consisting of senior or graduate students who have more extensive mathematical training and a more mature viewpoint.

It seems to this reviewer that those in the first category would find the book rather heavy going, but if they will expend the necessary effort, they will be rewarded by an insight into the fundamentals of statistical thinking that can hardly be obtained from any other current work on elementary mathematical statistics. But, human nature being as it is, many will probably continue to prefer a more superficial survey of a larger variety of statistical techniques to a searching examination of the foundations upon which those techniques rest.

Professor Neyman's presentation of probability theory, although restricted to the viewpoint of probability "as a mathematical model of relative frequencies observable in a long series of trials," is excellent. He does not hesitate to use the language and notation of the mature mathematical statistician; the beginner need not let this deter him. The vocabulary and symbolism must be learned sometime by a prospective statistician and it may as well be at the start of his career. The exposition is clear and is accompanied by many examples and exercises. Biologists should be delighted to learn that a chapter of 67 pages is devoted to probabilistic problems of genetics, and that other applications to biological statistics appear throughout.

As is to be expected from the title, the book is primarily an exposition of probability theory, with probability defined as a relative frequency, together with applications of that theory to the general problem of testing hypotheses and some typical problems encountered in laboratory experimentation and in sampling. The concepts underlying decision functions play a prominent part and the power of a test is given adequate attention. Considerable material ordinarily given in texts on mathematical statistics is not even mentioned, consequently there is here no threat to the demand for such treatises. Most statistical taxonomists will doubtless classify it as a book on probability rather than on statistics per se. At the same time, it contains much that ought to be included in texts on mathematical statistics but seldom is.

This reviewer recommends the book highly to readers of this journal who have the wish and the fortitude to get at the heart of the subject. It is not easy fare; anyone seeking a pablum, one that will impose no strain on his digestive processes will not find it here. But, for that matter, he will not find it anywhere else either.

Walter A. Hendricks