Statistics and Experimental Design, by Norman L. Johnson and Fred C. Leone. John Wiley and Sons, Inc., New York, 1964. Vol. I, xiii + 523 pages, $10.95; Vol. II, ix + 399 pages, $11.50.

Although written primarily for workers in the physical sciences and engineering, the level of presentation and extensive coverage of techniques make the volumes useful for anyone requiring a knowledge of statistical methods in other areas. After brief chapters on descriptive measures and probability, the first volume covers discrete and continuous distributions, order statistics, estimation, hypothesis testing, tests of significance, nonparametric tests, control charts, regression and correlation. A brief chapter discusses prior distributions, decisions and loss functions, and sampling costs. The major part of the second volume is devoted to analysis of variance. The remaining chapters deal with sequential analysis, multivariate observations (including the treatment of response surfaces) and finally sample structures.

The authors deliberately dispose of the concept of probability by defining it as the limit of the relative frequency and deduce the properties of the probability function on the basis of this definition. Basic concepts such as "event" and "random variable" also receive inadequate treatment. The potential user, with little prior knowledge of probability theory, would do well to supplement the work with the first few chapters of, for example, P.L. Meyer's "Introductory Probability and Statistical Applications" (Addison-Wesley, 1965). This however, should be taken as a minor criticism. The work is well-conceived, carefully developed, and abounds in a large number of worked-out problems. There are excellent lists of exercises at the ends of the chapters.

H. Kaufman, McGill University

Topological Structures, by W.J. Thron. Holt, Rinehart and Winston, Inc., New York, 1966. x + 240 pages. $9.00.

This text covers all the standard topics of general topology. After introductory remarks on set theory and ordered sets there is a brief discussion of various ways of defining a topological space. The author's development of the subject then starts with the open set axioms, the definitions by means of the closure operation and neighbourhood axioms being treated in later chapters. There follow chapters on subspaces, connectedness, bases of a topology, quotient spaces and product spaces. Convergence is described both by means of nets and filters, and the relation between the two concepts is discussed. Next come separation axioms, cardinality axioms, compactness and compactifications, metric and pseudometric spaces and uniform spaces, proximity spaces and topological groups. The last topic, which might appear unusual in a general topology text, is introduced as an illustration of the way in which topology can be combined with other structures.

As will be seen, this is, modulo variations due to personal preferences, the usual material for a first year graduate course in general topology. The text is written with admirable clarity. The logical thread of the argument is carried by a sequence of definitions and theorems, but this is liberally interspersed with "asides" of a less formal nature giving additional explanations and motivations. Each chapter is preceded by a historical and bibliographical note. Nonetheless this text may be difficult for the average student if he satisfies only the prerequisites stated by the author, namely knowledge of the topology of the real line and properties of real valued functions. For throughout the text (including the exercises) there are very few concrete examples, and it would appear desirable for the student to have some backlog of experience with sets in Euclidean spaces to enable him to appreciate the more abstract ideas treated here.

A.H. Wallace, University of Pennsylvania

Disquisitiones Arithmeticae, by Carl Friedrich Gauss, 1801; English translation, by Arthur A. Clarke, S.J. Yale University Press, New Haven and London, 1966. xx + 472 pages. $12.50.

At the beginning of 1795 a young man not yet eighteen happened upon a result he recognized as beautiful: an odd prime p is a factor of $x^2 + 1$ for some integer x if and only if the prime is of the form $4n + 1$. He surmised a connection with properties even more profound, and strove to discover the underlying principles and to find a proof. Succeeding, he was so enthralled he could not let these questions be. The young man was of course Gauss; and the book or saga, he wrote will still be read with delight in the year 3000. I choose three items from Gauss' notes listed at the end of the book. Gauss discovered the quadratic reciprocity law, by experiment, in March 1795, and completed its first proof on April 8, 1796. He proved that "a circle is geometrically divisible into 17 parts" on March 30, 1796; and so soon after must have solved the 2000-year old problem of Euclidean constructibility of regular polygons (included in Sect. VII of the Disquisitiones). It was this discovery, Bell tells us, which decided the young man to choose mathematics rather than philology.

Gauss is very special to mathematicians, and this first English translation is an event, even after 165 years. One's native tongue always comes easier, and so now many of us will have a real opportunity to become much better acquainted with a very great man. Myself, even though I had previously plowed through much of the original Latin, the French translation (1807), and the German one (1885), and had read various accounts of parts of Gauss' work (especially in H. J. S. Smith's Report on the Theory of Numbers, 1860-65), I found in reading this translation items I had forgotten or did not know, - and it was just delightful to browse through Gauss' reasoning and his approach to various questions, here and there.

There are, unfortunately, errors in the translation, and these disturbed me perhaps more than ordinarily because I felt a translation

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