The various methods of investigating the effects of structural flexibility on the dynamic stability are amply discussed, as well as methods of allowing for combined distortion and compressibility, the latter an extension of the general static stability mentioned previously.

The student and the practicing engineer will find the book a fairly comprehensive treatment of the subject.

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***Statistical Theory with Engineering Applications.*** A. Hald; trans. by G. Seidelin. New York: Wiley; London: Chapman & Hall, 1952. 783 pp. $9.00.

This book is well named, for the primary emphasis is on theory. The book is written for those who have had a standard course in differential and integral calculus. Although it would seem to be clearly within the reach of such students, a course in advanced calculus would be a real help to one who wished to follow all the derivations. Proofs are given for practically all the important developments. The author has avoided the use of characteristic functions and higher algebra in order to make the book available to a larger group.

To illustrate the theory, there are many numerical examples using engineering data. Data from non-engineering fields are also given to exemplify some of the theory. One might wish for more of the engineering background from which the data were derived, but more can hardly be expected in a book with the main emphasis upon theory. A serious deficiency in the book, as a textbook, is that there are no problems at all.

In the nearly 800 pages there is a very complete coverage of standard topics, such as significance tests, linear and multiple regression, and analysis of variance, as well as some topics not too commonly available. This subject matter is more directly of interest to the research engineer, rather than to the industrial engineer. Thus there is almost no emphasis upon acceptance sampling, either for measurements or attributes, nor upon control charts, which are tools of basic importance to the industrial man. It is true that most of the supporting theory of these methods is to be found somewhere in the book. But it is not all together, summarized and illustrated. Furthermore, there is almost no coverage of sequential analysis, which is useful both to the industrial man and to the research engineer. Finally, there is, from this reviewer's standpoint, too little emphasis on the higher moments of a distribution. For example, the very useful Pearson Type III curve is scarcely mentioned.

The foregoing omissions are, however, not too serious except for the industrial engineer. An author simply cannot cover everything, and the book is nearly 800 pages without this material. It should be a most valuable book for the research engineer and physical scientist, as well as for those working in other fields.

The book is clearly written—in fact, it is a remarkable job of translation. This reviewer found almost no typographical errors and none of any consequence. It is well illustrated by curves and graphs, and the proofs are compact but clear. A glossary of symbols with page references is given to help in the always difficult matter of statistical notation. It has a wealth of references.

There are no statistical tables, such as those for the $t$-distribution. These are all given in an auxiliary book (*Statistical Tables and Formulas,* 97 pp., $2.50) by the same publisher.

Altogether, the book is a most welcome addition to statistical literature.

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***Prelude to History: A Study of Human Origins and Palaeolithic Savagery.*** Adrian Coates. New York: Philosophical Library, 1952. 289 pp. Illus. $4.75.

In his preface Mr. Coates says: "This is not a book for the specialists and experts, though I hope they will not despise it." I have heard this book discussed by a number of specialists and experts in prehistoric archaeology, whose identities I shall not reveal. They do not despise it. Some of them even think it useful. But none of them chooses to say much about it.

Mr. Coates appears to be a man who has read profoundly. With all the references, new and old, at his fingertips, he can tell you exactly what everyone of consequence has said at any given moment. For that reason his work is a splendid intelligence report on the field of paleolithic archaeology, up to the turn of the half-century. He has, furthermore, read physical anthropology, primate behavior, ethnography, and psychology, over a classical background. He is an eminently well-educated man and he writes well.

The trouble is that, as Coates, he has not much to say. We are told that Julian Huxley said this and Gordon Childe said that. Even Coon said some things in 1939, which he would hesitate to repeat in 1952, but Coates does not know this. He lives in a world of books, not of men. That is why the experts have little to say about *Prelude to History.*

This silence is perhaps a pity, since the educated layman needs a well-written résumé of current archaeological knowledge, along with current theory, and there seems to be no other place where he can get both, in such abundance and clarity, for $4.75. It is also a pity that a man who has read so widely does not know that chipped flint balls from the lower paleolithic of Algeria could hardly have been used for stone-boiling. What is worse, he deduces from the existence of these few balls that "fire was also used from the earliest time for cooking" (p. 90). Boiling of any kind is a technique still unknown to the more primitive hunters today. There is no evidence whatever that the people who made the flint balls cooked at all, or even had fire. This example reveals a principle

—that no amount of book learning can take the place of field work and the privilege of chatting and corresponding informally with one's fellow-professionals. It is a pity that a dirt archaeologist who has these privileges cannot cover the ground with equal literary facility. Perhaps someday this miracle will take place and the intelligent layman will get the genuine article. In the meantime, with strong reservations in the interpretive field, this is a working substitute.

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***Frost Action in Soils: A Symposium.*** Presented at the Thirtieth Annual Meeting, January 9–12, 1951. Highway Research Board, Special Rept. No. 2. Washington, D. C.: National Research Council, 1952. 385 pp. $3.75.

This book discusses problems related to the freezing and thawing of soils—a branch of the young science of soil mechanics. It contains 39 papers written by 48 men, mostly engineers connected with highway departments, railroads, the Corps of Engineers, or educational institutions; but geologists, geographers, botanists, physicists, and soil scientists are represented. Canada contributed two papers, Norway two, England one, and the United States 34. These facts account for inevitable differences of opinion and widespread duplication of research.

The papers are grouped under six headings: "Climate and Distribution of Soil," "Soil Temperature and Thermal Properties of Soils," "Basic Data Pertaining to Frost Action," "Frost Action and Spring Break-up," "Remedies and Treatment," and "Needed Research."

Most of the authors agree that frost heaving is due to growth of ice crystals, often arranged in more or less well-defined layers, rather than to volume change accompanying change of state. Water is fed by capillary forces to growing crystals where soil is sufficiently fine-grained and where the capillary fringe above the water table extends into the freezing zone. Silts and, to a lesser extent, clays are susceptible to frost heave. Engineers define clays on the basis of particle size instead of mineral composition. One author, a geologist, emphasizes that the water-holding properties of the various clay minerals can affect the physical properties of soils. With modern methods of highway construction, pavements suffer less from heaving than from excessive amounts of water liberated by spring thaws.

An effective although expensive preventive method is replacment of susceptible soils with gravel, crushed stone, sand, cinders, or (in Norway) peat. Drainage, or raising highways above the general surface, is common practice. Calcium chloride prevents objectionable heaving, but the effects are not permanent.

Formulas are developed for predicting subsurface temperatures and the depth of freezing and thawing, but this problem is complicated by the variability of several factors. One writer estimates that it takes at least 22.7 years for heat from the earth to thaw a foot of permafrost upward from the bottom.

Typographical errors are common: titles under two diagrams are interchanged; some figures are illegible because of excessive reduction; and one paper having 35 illustrations refers to none of them directly by number. Absence of the jargon associated with "cryopedology" is refreshing. Although the book contains valuable information and some excellent papers, it does not come up to standards desirable in publications sponsored by the National Academy of Sciences and the National Research Council.

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# *Scientific Book Register*

***The History of American Epidemiology.*** Sponsored by the Epidemiology Section, American Public Health Association. C.-E. A. Winslow *et al.*; Franklin H. Top, Ed. St. Louis: Mosby, 1952. 190 pp. Illus. $4.75.

***Die Wuchsstofflehre: Ergebnisse und Probleme der Wuchsstofforschung.*** Hans Söding. Stuttgart: Georg Thieme, 1952. 304 pp. Illus. DM 33.

***Development of the Guided Missile.*** Kenneth W. Gatland. London: Flight Pub.; New York: Philosophical Library, 1952. 133 pp. Illus. $3.75.

***Psychiatry and the Law.*** Manfred S. Guttmacher and Henry Weihofen. New York: Norton, 1952. 476 pp. $7.50.

***Traité de Zoologie:*** Vol. I, ***Phylogénie, Protozoaires: Généralités, Flagelles.*** Pierre-P. Grassé, Ed. Paris: Masson et Cie, 1952. 1071 pp. Illus. 9000 fr.; 9600 fr. bound.

***Annual Review of Nuclear Science,*** Vol. 1. Stanford, Calif.: Annual Reviews, 1952. (Published in cooperation with the National Research Council.) 645 pp. $6.00.

***Design for a Brain.*** W. Ross Ashby. New York: Wiley, 1952. 260 pp. Illus. $6.00.

***Organic Chemistry: The Chemistry of the Compounds of Carbon.*** 2nd ed. Lucius Junius Desha. New York–London: McGraw-Hill, 1952. 595 pp. Illus. $6.50.

***Vergleichende Physiologie: Sinnesphysiologie,*** Band I. 3rd ed. W. von Buddenbrock. Basel: Verlag Birkhäuser, 1952. 504 pp. Illus. Cloth, 45.75 Swiss fr.; paper, 41.60 Swiss fr.

***Pasture Production and Management.*** R. H. Lush. New York–Toronto: Blakiston, 1952. 193 pp. Illus. $3.75.

***The National Health Service in Great Britain: An Historical and Descriptive Study.*** James Stirling Ross. New York: Oxford Univ. Press., 1952. 398 pp. $7.00.

***Mesons: A Summary of Experimental Facts.*** Alan M. Thorndike. New York–London: McGraw-Hill, 1952. 242 pp. Illus. $5.50.

***Elasticity in Engineering.*** Galcit Aeronautical Series. Ernest E. Sechler. New York: Wiley; London: Chapman & Hall, 1952. 419 pp. Illus. $8.50.

***Man the Chemical Machine.*** Ernest Borek. New York: Columbia Univ. Press, 1952. 219 pp. $3.00.

***The Indian Tribes of North America.*** Smithsonian Institution, Bureau of American Ethnology, Bull. 145. John R. Swanton. Washington, D. C.: Supt. of Documents, GPO, 1952. 726 pp. and maps. $3.50.