underlying mathematics is not given in textbooks of animal and plant breeding, while the original literature, stemming largely from R. A. Fisher and Sewall Wright, is notoriously difficult for the uninitiated. This book is an attempt to make some of the theory available in textbook form. It fills a real need and should be a welcome addition to the array of genetics textbooks.

The first part of the book—almost half—is devoted to basic statistical tools for quantitative genetics, including elementary probability, statistical estimation, and hypothesis testing, and some of the elementary theory of population genetics. The rest consists of a systematic statistical treatment of quantitative inheritance. The emphasis is on variance partition, regression and path analysis, inbreeding and correlation between relatives, and Kempthorne's own work on partition of dominance and epistatic components.

Although the introduction states that only high-school algebra is needed, the reader will find that many sections are much more understandable if he is familiar with the calculus and standard statistical procedures. The methods are usually those of the original author, though with added explanation and (especially with Fisher's work) fuller algebraic details.

The book is not without weaknesses. In places the algebra is more cumbersome and lengthy than necessary, and in general the book is repetitious. The explanations are not always clear and are sometimes quite confusing (see, for example, page 303). Also there are occasional slips in algebra, the most troublesome being on page 305, where the subscripts 1 and 2 are interchanged in most of the formulas. Some subjects are dealt with inadequately (for example, human genetics), and it would be preferable, I believe, either to omit them entirely or to do them more completely.

Despite these shortcomings, the book has enough material hitherto unavailable in textbooks to make it uniquely useful for students of biometrical genetics.

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The Ashanti. A proud people. Robert A. Lystad. Rutgers University Press, New Brunswick, N.J., 1958. vii + 212 pp. Illus. $5.

This unpretentious little book will serve the lay reader as a pleasant introduction to the present-day culture of the dominant people of the new state of Ghana. It summarizes, in a simple and painless style, most of the major facts about the social, economic, political, and religious life of the Ashanti nation, with special reference to the town of Goaso, where the author and his wife spent nearly a year in 1949–50. It is entirely authoritative, since the author is a trained anthropologist, an associate professor at Tulane University. Consequently, it should also prove useful to tourists and businessmen who visit Ghana.

In no respect, however, does the volume supplant, or even substantially supplement, the standard ethnographic descriptions of the Ashanti by Busia, Fortes, and Rattray. It is "written down" to about the high-school level of literacy and presents a highly oversimplified account of the culture, with no scientific analysis and extremely little new information. It does not, for example, even mention such complex but scientifically important matters as the famous system of double descent, with both matrilineal and patrilineal clans. Students at the college level will find it much too elementary for use as a text, perhaps even as collateral reading. The professional social scientist, the missionary, and the educated West African will continue to depend upon the earlier sources, and for a summary will use Manoukian's *Akan and Ga-Adangme Peoples of the Gold Coast* (International African Institute, London, 1950).

GEORGE P. MURDOCK
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Reason and Chance in Scientific Discovery. R. Taton. Translated by A. J. Pomerans. Philosophical Library, New York, 1957. 171 pp. Illus. $10.

The history of science, in addition to contributing to what might be called the liberal scientific education, has an undoubted potentiality in providing a record from which scientists can obtain methodological guidance through the experiences of their predecessors. The realization of that potential depends upon an increased cultivation of the field, especially in the more recent period. The product may be something like the present work, which cites and analyzes examples of chance, error, "flashes of thought," and other incidents rare and commonplace in the history of discovery and invention.

This book should interest scientists for the picture that it gives of this product of the history of science. The case histories selected are as various as 16th century astronomy and 20th century medicine, and an interesting attempt is made to correlate them. Unfortunately there are too many cases for the size of the book, and the resultant oversimplification sometimes jars the sensibilities of the historian. Neither scientists nor historians will appreciate the evidences of careless writing, such as the confusion between the terms *discovery* and *invention* (worsened by the translator) and the looseness of the use of the terms *chance, error,* and others.

The original French edition was more modest in format, title, and price.

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Clinical Pathology Data. Compiled by C. J. Dickinson. Thomas, Springfield, Ill., 1957. xviii + 91 pp. $4.

Clinical pathology could be defined as the application of methods and instruments of precision in the diagnosis and follow-up of disease. Physiology, chemistry, physics, microbiology, and immunology are being applied to clinical pathology, in an ever-growing manner. A vast amount of data has accumulated. Only the specialist in this field, the clinical pathologist, is in a position to separate the wheat from the chaff—and to select what is applicable and useful in a particular situation.

The purpose of this book is to classify some of the tests more commonly used in clinical laboratories by giving normal values and the diseases in which the values are raised or lowered. If properly used, the information may save much effort and time that would otherwise have to be spent on trying to find all these things in the library.

The subject matter is treated in 15 sections dealing, respectively, with blood and plasma, cerebrospinal and effusion fluids, feces, gastric contents, porphyrin metabolism, semen, urine, adrenal, pituitary, renal function, hepatic function tests, glucose tolerance test, tests for syphilis, special tests, and some simple procedures (given in brief, practical notes).

The section on blood and plasma has been divided into four subsections, on physical properties, tests of clotting and bleeding disorders, cellular constituents, and chemistry.

Abundant cross references enhance the value of the book.

The accuracy of presentation of the large mass of material is generally satisfactory. Occasional statements could be questioned. The Paul-Bunnell test in a dilution of 1:128 is claimed to be "practically diagnostic of glandular fever" (page 70). This claim is hardly acceptable. Fetal erythroblastosis is treated as synonymous with Rhesus incompatibility of the newborn (pages 12, 19), whereas the part played by the ABO system is referred to as "congenital ABO

incompatibility of the newborn" (page 68). The other responsible blood factors are not mentioned.

Since "biochemical results often differ according to technique used" (page xv), it would have been of some value had mention been made of the methods by which the normal values cited were obtained. This is done only in a few instances.

It is not always clearly stated whether the value given is for whole blood or serum (plasma). Although the modern trend is to report biochemical values on serum, this is not the case in this book (cholesterol, creatinine, glucose nonprotein nitrogen, urea, uric acid).

The conditions which raise or lower *p*H of urine are stated in reverse (page 47). The higher the *p*H, the lower the acidity.

The breakdown of the specific porphyrins is too detailed, since very few laboratories are prepared to analyze for the individual porphyrins.

The statement (page 49) that there are only 2 to 3 milligrams of creatine per 24-hour specimen of adult urine is incorrect.

The statement of normal value (100 percent) for urea clearance (page 59) is misleading; however the discussion tends to correct this. There is no mention made of standard clearance.

No reference to acetone (ketone bodies) in urine was found, except under "Practical analysis."

Although some of the newer tests are included, such as those for transaminase and 5-hydroxyindoleacetic acid in urine, "tubeless" gastric analysis and sweat test for fibrocystic disease of the pancreas are not mentioned.

American readers may be confused by the use of the term *glandular fever*, which has been entirely replaced by *infectious mononucleosis* in this country.

The book can be recommended to medical students and clinical pathologists and to physicians in general as a time- and effort-saving investment.

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Basic Animal Husbandry. John M. Kays. Prentice-Hall, Englewood Cliffs, N.J., 1958. 430 pp. Illus. $7.

A number of new books on animal husbandry have appeared in comparatively recent years, but this is such a changing field and the interests are so varied that the needs have not been exhausted. John M. Kays, the son of an outstanding and colorful author on animal husbandry as well as a noted judge of livestock, is well steeped in livestock lore and its importance in American agriculture.

The interrelationship of judging, breeding, feeding, and management is handled in a concise, logical, and admirable manner. To deal with all classes of livestock in discussing these relationships, as well as with marketing, disease, and parasite prevention and control, is a big assignment. If handled in detail, such a discussion would require a book too voluminous for an ordinary text for a college undergraduate course. However, though the treatment is of necessity brief in some cases, most subjects are handled rather adequately.

The sections dealing with by-products and the marketing of by-products is handled in accordance with the changing times and with the changes in relative values. The chapter on "Common horse unsoundnesses and ailments," though of rather limited use for the farmer of today, should be quite valuable to the light-horseman and the pony fancier.

It appears, in general, that the book has been well prepared, and the pictures are excellent. The author's emphasis on the practical aspects of production and marketing, rather than on the refinements of conformation and breed character (subjects more appropriate to a book on the show ring), is well placed. This book is a welcome addition to the library of the animal husbandman and should be of value to the college and high-school student as well as the layman.

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New Books

Engineering College Research Review. 1957. Engineering College Research Council. American Society for Engineering Education, New York, 1958. 438 pp. $2.

Our Nuclear Future. Facts, dangers, and opportunities. Edward Teller and Albert L. Latter. Criterion Books, New York, 1958. 184 pp. $3.50.

Basic Physics. A. R. Meetham. Pergamon Press, New York, and London, 1957. 155 pp. $3.75.

Algebra. A textbook of determinants, matrices, and algebraic forms. W. L. Ferrar. Oxford University Press, ed. 2, 1957. 228 pp. $2.80.

The Biotic World and Man. Lorus J. Milne and Margery J. Milne. Prentice-Hall, Englewood Cliffs, N.J., ed. 2, 1958. 543 pp. $7.50.

The New India. Progress through democracy. Planning Commission, Government of India. Macmillan, New York, 1958. 422 pp. Cloth, $5; paper, $2.50.

Feedback Control Systems. Otto J. M. Smith. McGraw-Hill, New York, 1958. 712 pp. $13.50.

Communication, Organization, and Science. Jerome Rothstein. Foreword by C. A. Muses. Falcon's Wing Press, Indian Hills, Colo., 1958. 206 pp. $3.50.

The Undiscovered Self. C. G. Jung. Translated from the German by R. F. C. Hull. Little, Brown, Boston, 1957, 1958. 113 pp. $3.

The Metallurgy of Vanadium. William Rostoker. Wiley, New York; Chapman & Hall, London, 1958. 194 pp. $8.50.

The Scientific Papers of Sir Geoffrey Ingram Taylor. vol. I, *Mechanics of Solids.* G. K. Batchelor, Ed. Cambridge University Press, New York, 1958. 603 pp. $14.50.

Growth of Crystals (Rost Kristallov). Reports of the First Conference on Crystal Growth, 5–10 Mar. 1956. English translation (original Russian text published by Academy of Sciences USSR, Moscow, 1957). Consultants Bureau, New York, 1958. 294 pp. $15.

Introductory Physics. An historical approach. Herbert Priestley. Allyn and Bacon, Boston, 1958. 533 pp. $7.50.

Health Facts for College Students. A textbook of individual and community health. Maude Lee Etheredge. Saunders, Philadelphia, ed. 7, 1958. 429 pp.

Advances in Virus Research. vol. V. Kenneth M. Smith and Max A. Lauffer, Eds. Academic Press, New York, 1958. 385 pp. $9.50.

Problems in Euclidean Space: Application of Convexity. Adams Prize Essay of the University of Cambridge, 1955–56. H. G. Eggleston. Pergamon Press, New York and London, 1957. 173 pp. $6.50.

Shackleton and the Antarctic. Margery Fischer and James Fischer. Houghton Mifflin, Boston, 1958. 575 pp. $7.50.

The Fastest Man Alive. Frank K. Everest, Jr., as told to John Guenther. Dutton, New York, 1958. 253 pp. $4.

Antibiotics Annual, 1957–1958. Henry Welch and Felix Marti-Ibanez, Eds. Medical Encyclopedia, New York, 1958. 1087 pp.

Man in the Primitive World, An introduction to anthropology. E. Adamson Hoebel. McGraw-Hill, New York, ed. 2, 1958. 694 pp. $9.

Witchcraft. Geoffrey Parrinder. Penguin Books, Baltimore, 1958. 208 pp. Paper, $0.85.

New Biology. No. 25. M. L. Johnson, Michael Abercrombie, G. E. Fogg, Eds. Penguin Books, Baltimore, 1958. 126 pp. Paper, $0.65.

Le Calcium et la Vie. Joseph Stolkowski. Presses Universitaires de France, Paris, 1958. 126 pp. Paper.

Fantasia Mathematica. Being a set of stories, together with a group of oddments and diversions, all drawn from the universe of mathematics. Clifton Fadiman, Ed. Simon and Schuster, New York, 1958. 317 pp. $4.95.

Purity Control by Thermal Analysis. Proceedings of the International Symposium on Purity Control by Thermal Analysis, Amsterdam, 1957. W. M. Smit. Elsevier, Amsterdam, 1957 (order from Van Nostrand, Princton, N.J.). 194 pp.

Lesser Worlds. Nesta Pain. Coward-McCann, New York, American ed. 1, 1958. 252 pp. $3.75.