Book Reviews

The Fundamentals of Electric Log Interpretation. M. R. J. Wyllie. Academic Press, 1954. x + 126 pp. Illus. $3.60.

Electric well logging is a method that measures the naturally occurring potentials set up at varying depths in the drilling mud of a bore-hole and the electric resistivities of the rock formations penetrated. Because these quantities depend on the permeability, porosity, and interstitial fluid content of the subsurface formations, the electric log has become one of the chief tools of the petroleum geologist and engineer. Qualitatively, the log may be employed for the identification of sedimentary strata and their correlation from one well to the next and, in simple cases, for an evaluation of whether specific beds may contain oil or gas or water. Quantitative interpretation is, however, necessary for more complex situations and for determining more precisely the effective porosity of a rock and the nature and percentage of the fluids filling the pore spaces.

The small book under review presents in simple and clear language the basic principles underlying the quantitative aspects of the electric log. Part 1, "The theory of quantitative log interpretation," is a singularly clear exposition of the physics of the materials involved and of the basic equations used to obtain the data desired from electric logs. Part 2, "The practice of quantitative log interpretation," has an especially fine discussion of the spontaneous-potential curve.

Because he considers that the interpretation of conventional resistivity logs is well covered by the widely known Schlumberger Documents Nos. 3 and 4, the author's chapter on these logs is incomplete. This is to be regretted as the one weakness in what would otherwise be a well-nigh perfect elementary textbook.

Brief but adequate treatment is given to the newer logging techniques that employ current-focusing and contact devices and induction.

This book is highly recommended to all nonspecialists who use the electric log.

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Los Trigos de la Ceres Hispánica de Lagasca y Clemente. Ricardo Tellez Molina and Manuel Alonso Peña. Instituto Nacional de Investigaciones Agronomicas, Madrid, 1952. xii + 516 pp. Illus. + plates.

The basis for this study is the collection of 1800 herbarium specimens of the genus *Triticum* made early in the 19th century by two Spanish botanists, Lagasca and Clemente. Through analysis and revision, Molina and Peña have reduced the original 30 species and as many "races" to the modern concept of eight species and varieties according to Korniche's system.

The taxonomic treatment in Part Two (354 pp.) comprises the major portion of this work and contains related data, transcriptions of the annotations, and locality notes. It is in effect a catalog of all the materials earlier developed by Lagasca and Clemente as the *Ceres española.*

The text is beautifully illustrated with 56 colored plates, drawn under the direction of Lagasca, and further documented with 96 photographs of the more controversial species and varieties. Part One and the appendixes provide a rich background of biographic information, pertinent not only to the lives of Lagasca and Clemente, but to their period and contemporaries. Much of this is scattered throughout the quarto volume as a series of 148 footnotes referring to botanists and other collaborators honored in new species or "races." Facsimile reproductions and photographs of historical implication are included.

This is a remarkably complete work and contains many of Lagasca's and Clemente's unpublished notes. The taxonomic effort and skill displayed by Molina and Peña are clearly indicated in the index of 35 pages to both synonymy and common names of the wheats of Spain. The appealing physical features are demonstrated in the clean topography, clear-cut font, and well-balanced format. The keys to species and varieties will make it useful to those interested in the genealogy of wheat. But the present emphasis on the origins of agricultural plants gives this volume added significance as a worth-while source of reference in the study of both economic and historical botany.

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Progress in Metal Physics. vol. 5. Bruce Chalmers and R. King, Eds. Interscience, New York; Pergamon, London, 1954. vii + 324 pp. Illus. $9.50.

The earlier volumes of *Progress in Metal Physics* will be familiar to all physical metallurgists. The subject matter covered by the series is broader than the title would suggest; it is doubtful whether any of the five articles in the present volume fall strictly within the domain of metal physics. However, I would certainly not register any complaint on this score.

The outstanding and longest contribution (135 pp.) to this fifth volume is the "Report on precipitation" by H. K. Hardy and T. J. Heal. The rival nucleation and fluctuation theories are critically reviewed, and their predictions are compared with the experimental data for some 10 different age-hardening alloys. The authors are to be congratulated on a lucid exposition of a notoriously involved subject.

Welcome additions are two articles dealing with the deformation of metals—a topic hitherto neglected in this series. Within the limits imposed by the title, "Geometrical aspects of the plastic deformation of

metal single crystals," R. Madding and N. K. Chen give an extensive discussion of the formation of slip lines and the slip systems in B.C.C., F.C.C., H.C.P., and other metal crystals. The article by N. J. Petch on "Fracture of metals" is less satisfactory. Some important contributions to this field are neglected, while undue emphasis seems to be placed on the author's own theory that associates Griffith cracks in metals with arrays of blocked dislocations.

The two remaining articles relate, respectively, to the solidification and structure of liquid metals. The former, by U. M. Martius contains an extensive summary of the data related to pure metals, but the segregation of alloys during solidification is only barely touched on. B. R. T. Frost gives a useful, if somewhat uncritical, review of the structure of liquid metals. The section of his article treating the thermodynamics of liquid alloys is too sketchy to be of much value and contains an excessive number of small errors which will be irritating to the specialist and a source of confusion to the nonthermodynamicist.

The only general complaint I would make is that the value of some of the contributions would have been enhanced by the inclusion of a summary either at the end or beginning of each article. Otherwise, the presentation and typography maintain the very high standard set by the previous volumes. An excellent name and subject index is included.

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Modern Experiments in Telepathy. S. G. Soal and F. Bateman. Yale Univ. Press, New Haven, 1954. xv + 425 pp. Illus. + plate. $5.

The authors have presented a book intended for the purposeful reader and the student of parapsychology. Its primary purpose is to consider much of the available evidence concerning telepathy from the point of view of the scientific statistician. This purpose is admirably fulfilled by a careful résumé of the historical background and experimental approaches to paranormal happenings. As nearly as possible, the authors have attempted to confine themselves to extrasensory perception (ESP) in its relation to card guessing, basing their work on the assumption that "the validity of any piece of scientific research depends ultimately upon its confirmation by other investigators. . . ." They have assembled an impressive array of experiments and data, carefully evolved, minutely recorded, and, within limits, capable of reproduction by other investigators. In their endeavor to eliminate deception, fraud, and artifact, they have imposed extreme and, at times, absurd precautions.

A secondary theme of the book appears to be a refutation of those hypotheses that seek to explain the beyond-chance results of ESP experiments as being due not to telepathy or extrasensory perception but, instead, to artifacts or defects in our theory of probability. The evidence offered as rebuttal to these hypotheses, however, is based chiefly upon statistics derived from the very probability theory under question. It seems that the reliability of such reasoning is unsound. More attention might well be directed not toward an evaluation of the mathematical accuracy of those statistics dealing with beyond-chance expectations but rather toward a determination of whether random distribution based upon these statistics actually behaves in practice as would be predicted by accepted probability theory.

The book provides, in addition to adequate testing techniques, a review of the hypotheses that seek to explain ESP., a summary of current research in the field, a correlation of parapsychology with the more orthodox sciences, and an insight into methods of statistical analysis. An extensive appendix, a bibliography, and a well-organized index enhance the usefulness of the book as a guide for those who wish to investigate or evaluate paranormal phenomena on a scientific basis.

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Complex Variable Theory and Transform Calculus. With technical applications. N. W. McLachlan. Cambridge Univ. Press, New York, ed. 2, 1953. xi + 388 pp. Illus. $10.

This is a second edition of a work originally published in 1939 under the title *Complex Variable and Operational Calculus with Technical Applications.* In the preface to this new book, the author says, in speaking of the two editions:

> . . . the degree of rigour seemed to be adequate, but certain pure mathematicians (and physicists!) who reviewed the book disagreed. In the interim, the standard of technical mathematics has improved, and it is now possible to be more rigorous than before. Accordingly the chapters on Complex Variable Theory have been rewritten, amplified, and made rigorous enough for all but the pure mathematician, *to whom the book is not addressed.*

This change in attitude toward mathematics is most welcome, although it would seem that there is still much room for improvement in the average electrical engineering article of the present day. Let us hope that McLachlan's colleagues will follow his lead.

Almost exactly one-half of the book is devoted to an exposition of certain portions of the theory of functions of a complex variable, particularly such topics as the calculus of residues, contour integration, operations with integrals, and transform theory. The second half deals with applications of these mathematical disciplines to a variety of technical problems drawn largely from electrodynamics and related fields. The more specialized applications include studies of the influence of gun recoil on the motion of an airplane, radio receiver circuits, various aspects of partial differential equations, loaded and unloaded cable circuits both with and without terminal apparatus, electric wave filters, condenser microphones, and loud-